

ระบบฐานข้อมูลความหลากหลายของการใช้สมุนไพรที่ใช้เป็นสูตรยาพื้นบ้าน
ของชมรมแพทย์แผนไทยอำเภอชะอวด จังหวัดนครศรีธรรมราช
A Database System for the Diversity of Medicinal Herbs used as
Traditional Medicinal Formulas of the Cha-Uat Thai Traditional
Medicine Club, Cha-Uat District, Nakhon Si Thammarat Province

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บทคัดย่อ

ปัจจุบันสมุนไพรได้รับการยอมรับในการนำมาใช้เป็นยารักษาโรคและบำบัดอาการต่าง ๆ อย่างแพร่หลาย ซึ่งผู้เชี่ยวชาญแต่ละท้องที่จะมีวิธีการใช้สมุนไพรที่มีความจำเพาะแตกต่างกัน งานวิจัยนี้มีวัตถุประสงค์เพื่อเก็บรวบรวมสมุนไพรที่ใช้เป็นสูตรยาของชมรมแพทย์แผนไทยอำเภอชะอวด จังหวัดนครศรีธรรมราช และพัฒนาแอปพลิเคชันระบบฐานข้อมูลพืชสมุนไพรสำหรับการสืบค้น การดำเนินการวิจัยได้รวบรวมข้อมูลสมุนไพรโดยใช้วิธีการสัมภาษณ์แพทย์แผนไทยที่ได้รับประกาศนียบัตรแพทย์แผนไทย จำนวน 2 คน แล้วรวบรวมรายการสมุนไพรในสูตรยา ภาพถ่าย และสรรพคุณทางยานำมาจัดทำฐานข้อมูลในรูปแบบแอปพลิเคชัน เผยแพร่ให้แก่ผู้สนใจกลุ่มต่าง ๆ จากการสัมภาษณ์พบว่าสมุนไพรที่ใช้มีจำนวนมากถึง 69 สายพันธุ์ ใน 37 วงศ์พืช และมีการใช้พืชในวงศ์ Zingiberaceae มากถึงร้อยละ 21.73 (15 ชนิดพืช) ชมรมสร้างสูตรยาสืบสูตร โดยใช้ส่วนใบเป็นส่วนผสมในสูตรยา มากที่สุดร้อยละ 25.28 และใช้แก่นน้อยที่สุดร้อยละ 1.14 สูตรยาของชมรมมีการผสมสมุนไพรแต่ละสูตรมากกว่า 5 ชนิดสมุนไพร มีเพียงสูตรฟ้าทะลายโจรที่ใช้สมุนไพรเพียงชนิดเดียว จากการรวบรวมข้อมูลและจัดเก็บในรูปแบบแอปพลิเคชัน ใช้งานผ่านระบบปฏิบัติการแอนดรอยด์และไอโอเอส ที่ผู้ใช้สามารถสืบค้นด้วยคำค้นสั้น ๆ ผ่านเครื่องมือสื่อสารและประเมินความพึงพอใจในการใช้งานแอปพลิเคชันด้วยตัวแทนนักวิชาการ นักเรียนหรือนักศึกษา และประชาชน พบว่าความพึงพอใจอยู่ในระดับดีมาก (ค่าเฉลี่ยความพึงพอใจรวมเท่ากับ 4.65)

คำสำคัญ: สมุนไพร สูตรยา แพทย์แผนไทย ระบบฐานข้อมูล โมบายแอปพลิเคชัน

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Abstract

Herbs are increasingly being used as medications and therapies for a variety of ailments. Herbs are employed in a variety of ways by professionals in each field, each with its own set of characteristics. The goal of this study is to collect plants utilized in the Cha-Uat Thai traditional medicine club therapeutic formulations and compile them into a database of medicinal plant uses. Herbal, medicinal use, and plant parts utilized in formula data were gathered by contacting two Thai traditional physicians who were competent in Thai traditional medicine. Plants from the medicinal blend were then compiled into a list and made into an app that includes plant photos as well as information about their therapeutic properties. There are up to 69 herb species in 37 plant families, with Family Zingiberaceae being the most common (21.73 percent, 15 plant species). The group creates ten folkloric medication formulations that use more than five plants and diverse plant components. The majority of plant components were included in the recipe, with leaves accounting for 25.28 percent and pith accounting for 1.14 percent, except for the *Andrographis paniculata* preparation, which comprised only one plant species. A database application was developed for usage on smartphones running the Android and iOS operating systems. Academics, students, others (10 persons each) were assessed using a simple search by praising the application, which was subsequently reviewed using a satisfaction questionnaire after it had been used extensively. The findings indicated that the samples were generally happy with the usage of the herbal database, with a total satisfaction rating of 4.65.

Keywords: Herb, Formula, Traditional medicine, Database system, Mobile application

Introduction

The province of Nakhon Si Thammarat is geographically diversified. It consists of mountains, oceans, and plains, and its wet climate all year contributes to the richness of fauna and vegetation (Kaewchanid *et al.*, 2020). As a result, natural resource utilization has become more diverse, and it has become a heritage passed down from generation to generation. For example, ingesting a range of vegetables as a meal or introducing diverse plant species to be used as remedies for endemic ailments until it was born as a village sage with a local medicinal recipe (Cordier and Steenkamp, 2011). Plants play an essential part in the collection of secondary compounds, which have a wide range of qualities and are useful in medicine. They are classified as alkaloids, glycosides, essential oils, vitamins, and minerals and are found in plant components such as leaves, stems, fruits, and flowers (Batool *et al.*, 2019). The principal ingredients found in medicinal

plants are contemporary pharmaceuticals manufactured by scientists to ensure the drug's success and offer adequate medication to cure (Batool *et al.*, 2019). Long-term pharmaceutical use, on the other hand, is damaging to the body (Allen *et al.*, 2014). The World Health Organization concentrated on the use of herbs, which are plants that contain a wide variety of significant medicinal components and have been used for a long time to record this essential information (World Health Organization, 2013). Methods and preparation techniques: Each locale has its strategies for acquiring therapeutic herbs. Despite being the same plant, herbal components such as leaves, stems, seeds, roots, and fruits are used in a variety of ways. The introduction of medicinal formulas may entail the use of a variety of medicinal plants to improve the efficacy of that particular treatment. Furthermore, the extraction method for vital components found in herbs varies from soaking in solvents such as water and alcohol to applying heat to the specific critical ingredient (Sintupachee *et al.*, 2020, 2022). Herbs have long been utilized in folklore; for example, Kwao Krua (*Pueraria mirifica*) is used to stimulate hormones, ginger (*Zingiber officinale*) assists digestion, and antioxidant-rich plant mixtures are used as diabetic medication (Teapaisan *et al.*, 2017). The gathering of information on the use of medicinal plants will have far-reaching consequences. In addition to serving as the foundation for comprehensive scientific research, it may have an impact on society, the economy, local people's lives, and long-term environmental development (Sintupachee *et al.*, 2022). Plant biodiversity management with the local community as a driver even though the world has changed, data collection is becoming more relevant and widespread (Tanaka *et al.*, 2008). Cha-Uat is a district in Nakhon Si Thammarat Province's southernmost region, encompassing an area of around 705.36 square kilometers (Office of Agriculture and Cooperatives, Nakhon Si Thammarat Province, 2021). Orchards are a type of profession. There are several herbal categories, each of which is unique in its manner. The Cha-Uat Thai traditional medicine club, which has qualified members, pharmacists, and credentials, allowing folk healers to develop and sell treatments. Furthermore, the group has developed a pharmaceutical formula that incorporates indigenous plants into the therapeutic mix. It has unique characteristics, and its members are most likely ancient data collectors who will be important to future generations.

The focus of developing a database system for human resource development has been on creating an environment that promotes human resource growth and empowerment (FitzHenry *et al.*, 2015). A database system is a system that accumulates multiple bits of information that are connected systematically. There is a clear link between data and what allows users to utilize and maintain good data security (Cabinet Secretariat, 2018). The database included information from several systems and is an essential component of application development. The capacity to add, remove,

update, and produce reports to get access to data in a database is referred to as "data access." (Ratnapinda *et al.*, 2020). Apps are computer programs that run on mobile devices. It is simple to use and does not necessitate any complicated procedures. The expansion of mobile device applicability with compatibility for both operating systems: Android and iOS (Bender, 2020). It is currently commonly used as a data management and accessing tool in the building of database systems. The System Development Life Cycle (SDLC) is used, which includes six development stages: system requirements specification, system design, system testing, and system implementation and assessment methods of acquiring information for these civilizations to thrive and survive. It is a written record based on family records, or it may be thought of as a collection of publications that are ready for distribution but in low supply. People who are still struggling to obtain, and it will probably be lost due to a variety of circumstances (Pires *et al.*, 2020). A database system is a system that uses digital technology to store data systematically. This will help to minimize data loss and reduce the quantity of duplicated storage. Individuals will also be able to access information at any time and from any location once an internet infrastructure is in place. Furthermore, by typing key terms, you may obtain information quickly. The goal of this study is to look into the medical formula botanicals used in the Cha-Uat Thai traditional medicine club, which has long utilized formula herb as a tradition, and then build an herbal database system based on the information gathered.

Materials and methods

1. The population and samples used in the research

Two Thai traditional medicine practitioners, the Cha-Uat Thai traditional medicine club, Cha-Uat district, Nakhon Si Thammarat Province, and a group of fifteen herbal database application users, all of whom were academics, comprised the population (10 academics, 10 students, and 10 members of the general public).

2. Area for Herb Sampling and Survey

The Cha-Uat Thai traditional medicine club located in Nong Chik Village, Nang Long sub-district, Cha-Uat district, Nakhon Si Thammarat Province, performed herb sampling and surveys. Cha-Uat district has an area of 833 square kilometers and is situated at 7°55'469"N latitude and 99°59'79"E longitude (Figure 1). The storage area is defined by the terrain. It has been used for farming, rubber plantations, orchards, and even as a residence.

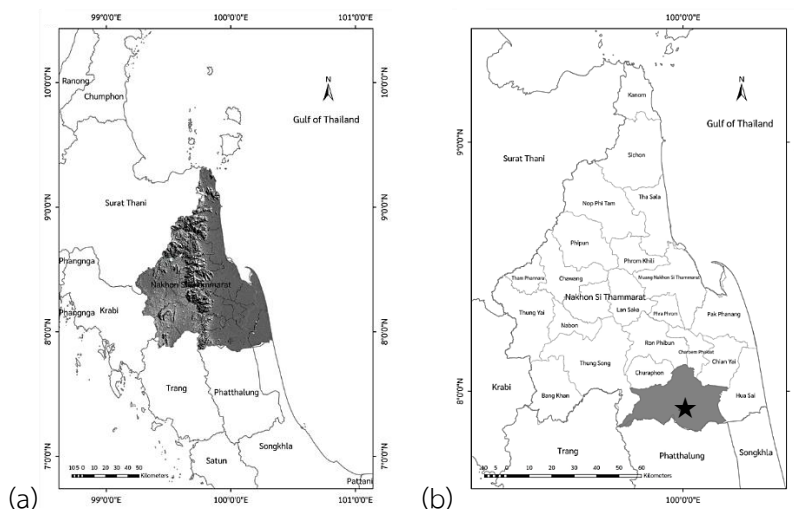


Figure 1 Map of Nakhon Si Thammarat Province (a) and the Cha-Uat Thai Traditional Medicine Club's location in Cha-Uat District (b) which is labeled as the ★.

3. Plants with medicinal properties

Investigate and gather therapeutic herbs from two Thai traditional medicine s' plots and the Cha-Uat Thai traditional medicine club members' plots in Cha-Uat district, where medicinal plants are cultivated to be utilized in folk medicine recipes devised by the club to heal diseases and sold as raw materials. The herbal samples were returned to the laboratory, and a Voucher specimen was made for categorization at the Specialized Research Unit on Insects and Herbs, Faculty of Science and Technology, Nakhon Si Thammarat Rajabhat University. First, the taxonomy was identified using Bailey's Standard Encyclopedia of Horticulture (Bailey, 1963; Victor *et al.*, 2004). The plant components were identified using the instrument in the course book and then, validated by an expert at the Forest Resources Management Office 12 (Nakhon Si Thammarat), Royal Forest Department.

4. The usage of herbs

The information form was used to interview two Thai traditional medicine practitioners from the Cha-Uat Thai traditional medicine club who obtained a certificate in Thai traditional medicine and are allowed to create traditional medications for the herbal data. After gathering and identifying the herbs, medicinal plant samples may be utilized to discover therapeutic properties. Bringing medicinal plant ingredients needed in pharmaceutical production, photographs, interview data, and strategies for developing medicinal formulations are all being gathered into a system, as are experts learning more about the origin and identifying species, and returning the obtained data to interviewers for evaluation before analyzing the data.

5. A medicinal plant database system development

Apps have been developed using a variety of plants used in the club's therapeutic formula, as well as the needs of diverse customer groups. Database analysis, as well as the design and development of mobile-friendly web apps utilizing the PHP programming language, the MySQL database management system, and the user-friendly bootstrap framework (Pires *et al.*, 2020). The procedure is broken down into six steps, which are as follows: First-round polling: It is a study of the club's demands for Thai traditional medicine, as well as conducting interviews and studying resources to define, the second phase is system requirements: This is the result of a preliminary survey to determine the needs for an herbal database. The next stage is system development, which is related to the building of the herbal database. The user interface, processing, browsing, application architecture, and development tools were all chosen. Bring it to the attention of professionals who examine it, give feedback, and make more design adjustments. The fourth stage is program creation, which entails installing a database system and developing programs for the various components that have been built. The fifth step is system testing, which is the approach used by the first developer to build the operation. It is carried out by an expert and a user representative, and then it is altered to satisfy people's needs. The final phase was system installation and evaluation: this is the process of putting the essential data in place so that services may be provided. A total of 30 users (10 academics, 10 students, and 10 of the others) were chosen particularly to test the system and assess their satisfaction.

6. Data analysis

Data analysis integrating taxonomic data with Thai traditional medicine information to evaluate and show medicinal plant data in tables and graphs. The satisfaction questionnaire responses were examined. The information was then statistically analyzed with the Statistical Package for the Social Sciences (SPSS) to determine:

1) The mean and standard deviation. The outcomes were then compared to the assessment criteria (Muhtaseb *et al.*, 2012; Wilson *et al.*, 2006): The average is 4.50-5.00, indicating that the majority of people are satisfied, "most satisfied". The average is 3.50-4.49, indicating that the respondent is extremely happy, "very satisfied". The average is 2.50-3.49, indicating moderate satisfaction, "moderately satisfied". The average is 1.50-2.49, indicating dissatisfaction, "less satisfied". The average is 1.00-1.49, indicating that the majority of people are dissatisfied, "least satisfied"

2) The dependent t-test statistical analysis was done to analyze the difference in average response between sample groups. The significant difference is the *p*-value of 0.05.

Results and discussion

1. The medicinal formulae plant

The Cha-Uat Thai traditional medicine club collected medicinal plants in the area, which included herbs from 37 different plant families and 69 distinct species listed in Table 1. The prominent medicinal plants used in the formula in the club are from the Zingiberaceae family (21.73 percent, 15 species), followed by plants from the Acanthaceae, Menispermaceae, and Rubiaceae, (5.79 percent, 4 species), Piperaceae, (4.34 percent, 3 species), Lamiaceae, Fabaceae, Euphorbiaceae, Leguminosae-Caesalpinioideae, and Capparaceae (2.89 percent, 2 species), and 1.45 percent (1 species) of the 28 remain families (Figure 2a). Therapeutic plant flavors included hot, cold, bitter, bland, astringent, sweet, and sour (Table 1). The club is unusual in that it combines herbs from the Zingiberaceae family in medicinal formulas as well as various herbs in different ways to generate a range of massage oil compositions.

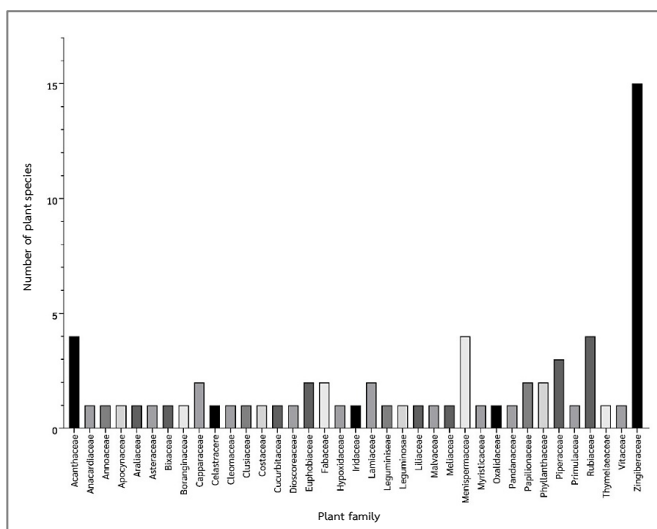


Figure 2 The Cha-Uat Thai traditional medicine club's usage of medicinal plant families in the Cha-Uat district

The taste of the herbs is employed by the doctor to determine the characteristics of the recipe. In its medicinal preparations, the club uses the following herb parts: leaves (25.28 percent), tubers (14.94 percent), trees/plants (14.94 percent), vines (10.34 percent), fruits (9.19 percent), rhizomes (8.04 percent), roots (6.89 percent), flowers (4.59 percent), bark (2.29 percent), seeds (2.29 percent), and pith (1.14 percent) as an ingredient (Figure 3). Plant components, like others, are employed as a medical practice. Leaf, roots, flowers, fruits, seeds, bark, stem, and tuber portions were commonly used. In the other studies, for example, the use of leaves in herbal production was followed by the use of roots (Saradha, 2022).

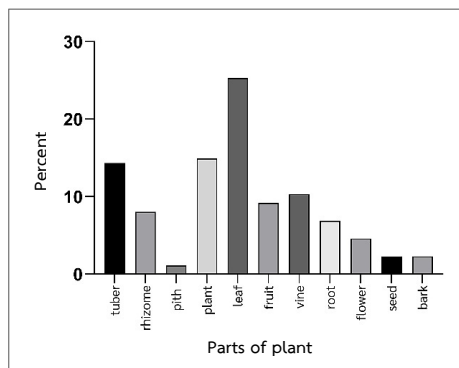


Figure 3 The section on medicinal plants shows the proportion of medicinal plants with that plant component as a fraction of the total number of medicinal plants.

The residents have already developed it as a food garden. It simplifies the search for herbal usage when members of the community interact with local pharmacies, simple formulae are passed on. It may be used alone and has been extensively distributed to teach members of the community how to use medicinal plants for self-healing. Furthermore, these old abilities might be lost since the club's members are still young to inherit data collection and transmission for dissemination in a variety of forms so that the new generation, both in the educational system and the broader public, may easily and comfortably access information. The club manufactures ten folkloric medicinal formulas with the distinctiveness that originates from the use of several Zingiberaceae species as raw materials in the production of massage oil, it is an outstanding product for activities in the club. Herbs consisting of Black Galingale (*K. parviflora*), White Galingale (*K. galanga*), Wan Chak Motluk (*C. comosa*), Bat flower or Black lily (*T. chantrieri*), dragon-of-the-world or tropical leaf-flower (*P. pulche*), Wan Jai Dum (*C. aeruginosa*), Black Berry Lily or Leopard Flower (*I. domestica*), Weevil Lily or Hill Coconut (*Molineria latifolia*), and Phaya Wan (*Curcuma* sp.1) was also a common ingredient in all of the club's medicinal formulas: blood-nourishing compositions, hemorrhoid, treatment carminative formula No.1, fat loss formula, allergy reducing formula, carminative formula No. 26, remedy for *A. paniculate* formula, recipes for gastritis and acid reflux, and a colon cleansing remedy (the genuine component in the formulation data is not displayed in this research). It is the usage of herbs that is inherited, since other studies, such as those done in China, report on the use of herbs in the family Zingiberaceae in therapeutic compositions (Sabatini *et al.*, 2016). Herbal extracts are used in India; each component is promptly put to use by eating, boiling, drinking, pounding, and concealing wounds (Feng *et al.*, 2016); however, in this club, herb components are mixed in different ratios and processed using various processes such as boiling, steaming, and kneading. The most common way of producing pharmaceuticals is in the form of

capsules consisting of dried herbal raw components combined. The components were weighed and pulverized before being filtered through a screen and sealed in capsules. The process includes extracting active components in alcohol (40%) by roughly crushing the herbs in the proper proportions and placing them in an alcohol-heated container. Recipe for massage oil: The herb combination is fried in oil in a coarse grinding ratio, and everything but the bottled oil is filtered away. Herbal compress recipe: mix the herbs in the quantities specified on the label and wrap them in fabric to form a sellable compress. The club's ten therapeutic recipes will feature more than five medicinal herb species as well as plant portions from diverse plant sections. The final method uses *A. paniculata* leaves as the only raw ingredient in the medicinal mixture to create an antipyretic medication. Plants' usage as medicine will dwindle with time, and indigenous formulations will become extinct. Efforts to collect knowledge on therapeutic plants and traditional medicinal recipes that have long been believed and practiced. It is a valuable cultural treasure that must be protected. The use of therapeutic plants in everyday life. The treatment of sickness, in particular, is a cultural treasure of each civilization that should be preserved since it embodies the cohabitation of people and plants. It is an essential aspect that adds to the conservation value (Ronra and Kodand, 2020).

2. The construction of an herbal database system

The app technique was shown by using basic phrases such as plant name, attributes, or scientific name, which presented all information involved on the screen, and the user may then click on the word of interest to assess additional information (Figure 4).



Figure 4 Depicts an application for an herbal database system. It is a search for information from medicinal characteristics that will result in four varieties of plants being returned (a). The scientific name of the plant will be displayed on the screen when picking the plant (b). Herb specifics, including all data gathering (c).

Table 1 Medicinal herbs used at the Cha-Uat Thai traditional medicine club in the Cha-Uat district.

no.	family	scientific name	common name (Thai/English)	therapeutic plant flavors	medicinal properties	herbal parts
1	Acanthaceae	<i>Rhinacanthus nasutus</i> (L.) Kurz.	ทองพันชั่ง/ Snake jasmine	cold	various skin diseases	leaf
		<i>Andrographis paniculata</i> (Burm.f.) Nees	ฟ้าทะลายโจร/ Bitterweed	bitter	fever	leaf
		<i>Thunbergia laurifolia</i> Lindl.	รางจืด/ Blue trumpet vine	bland	fever	leaf
		<i>Acanthus ebracteatus</i> Vahl.	เห็อกปลาหมอ/ Sea holly	hot	fever	tree/ plant, leaf
2	Anacardiaceae	<i>Spondias pinnata</i> (L. f.) Kurz	มะกอกป่า/ Hog-plum	sour	expectorant	fruit
3	Annoaceae	<i>Uvaria grandiflora</i> Roxb.	กล้วยมูสัง/ Calabao	sweet	fever	fruit
4	Apocynaceae	<i>Cryptolepis dubia</i> (Burm.f.) M.R.	เถาเอ็นอ่อน/ Wax leaved climber	bitter	tendon	vine
5	Araliaceae	<i>Schefflera leucantha</i> R. Vig	หนุมนานประสานกาย/ Dwarf umbrella tree	astringent	bone	leaf
6	Asteraceae	<i>Vernonia elliptica</i> DC.	ตานหม่อน/ Curtain creeper	cold	fever in children	tree/ plant
7	Bixaceae	<i>Bixa orellana</i> L.	คำไทย/ Lipstick tree achiote lipstick plant	sweet	expels gas in the stomach	flower
8	Boraginaceae	<i>Heliotropium indicum</i> L.	หญ้าวงช้าง/ Indian turnsole	cold	fever	tree/ plant
9	Capparaceae	<i>Crateva adansonii</i> DC. subsp. <i>trifoliata</i> (Roxb.) Jacobs.	กุ่มบก/ Garlic pear tree	bland	fever	leaf
		<i>C. religiosa</i> G.Forst.	กุ่มน้ำ/ Spider tree	bitter	fever	bark
10	Celastraceae	<i>Salacia chinensis</i> L.	ลุ่มนง ก้านแดงจีน/ Chinese Salacia lolly berry	bitter	tendon	vine
11	Cleomaceae	<i>Cleome viscosa</i> L.	ผักเสี้ยนผี/ Asian spiderflower or tick weed	bitter, hot	aches	tree/ plant
12	Clusiaceae	<i>Garcinia cowa</i> Roxb. ex Choisy	ชะมวง/ Cowa mangosteen	sour	expectorant	leaf
13	Costaceae	<i>Costus speciosus</i> Smith	เอื้องช้าง/ Crepe ginger setawar tawar	bland	fever	tree/ plant
14	Cucurbitaceae	<i>Momordica cochinchinensis</i> (Lour.)	ฟักข้าว/ Chinese bitter-cucumber	bitter	fever	fruit
15	Dioscoreaceae	<i>Tacca chantrieri</i> Andre	ว่านค่างควาดำ ต้นเนระพูสีไทย/ Devil flower bat	bland	strengthening	tree/ plant
			flower cat's whiskers			
16	Euphorbiaceae	<i>Baliospermum montanum</i> Muell.A.	ตองแตก หรือทนต์/ Ed physic nut	bland, bitter	expels gas in the stomach	root, tree/ plant
		<i>Jatropha podagrica</i> Hook.	หนุมนานนั่งแท่น/ Buddha belly plant bottle	bland	nourish	leaf
			plants shrub			
17	Fabaceae	<i>Cassia alata</i> (L.) Roxb.	ชุมเห็ดเทศ/ Candle bush	bitter	various skin diseases	leaf
		<i>Acacia concinna</i> (Willd.) DC	ส้มป่อย/ Shikakai soap-pod	sour, astringent	expectorant	leaf
18	Hypoxidaceae	<i>Curculigo latifolia</i> Dryand. ex W.T.Aiton	ไฉ้เหล็ก ว่านสากเหล็ก/ Weevil lily hill coconut	bland	nourish	tuber

Table 1 (Continued)

no.	family	scientific name	common name (Thai/English)	therapeutic plant flavors	medicinal properties	herbal parts
19	Iridaceae	<i>Iris domestica</i> (L.)	ว่านหางจิ้ง/ Leopard flower blackberry lily	hot	expels gas in the stomach	vine
20	Lamiaceae	<i>Vitex negundo</i> L. <i>Clerodendrum paniculatum</i> L.	คนทีสอดดำ/ Chaste tree นมสวรรค์/ Pagoda flower	hot astringent	expels gas in the stomach fever	leaf flower
21	Leguminosae- Caesalpinioideae	<i>Bauhinia acuminata</i> L. <i>Clitoria ternatea</i> L.	กาหลง/ Dwarf white orchid tree อัญชันบ้าน/ Butterfly pea	sour bland	cough, headache, phlegm fever	root, leaf, tree/ plant, flower flower
22	Liliaceae	<i>Dianella ensifolia</i> (L.) DC	ยาหนูต้น/ Umbrella dracaena	bitter	various skin diseases	leaf
23	Malvaceae	<i>Sida acuta</i> Burm.f.	หญ้าเข็มมอญ/ Common wireweed teaweed	bland	fever	tree/ plant
24	Meliaceae	<i>Azadirachta indica</i> A. Juss.	สะเดา/ Neem tree	bitter	fever	leaf
25	Menispermaceae	<i>Arcangelisia flava</i> (L.) Merr. <i>Tinospora tomentosa</i> Miess. <i>Tiliacora triandra</i> (Colebr.) Diels <i>T. crispa</i> (L.) Miers ex Hook.f. & Thoms.	ขมิ้นเครือ/ Yellow fruit moonseed ชิงช้าชาลี/ Petawali makabuhai ย่านาง ย่านนาง/ Bai yanang บอระเพ็ด/ Petawali makabuhai	astringent bitter bland bitter	fever fever fever	tree/ plant vine vine vine, leaf vine
26	Myristicaceae	<i>Knema globularia</i> (Lam.) Warb.	ต้นหัน/ Small-leaved nutmeg	hot	skin disease	seed
27	Myrtaceae	<i>Eugenia polyontha</i>	แพ/ Pae	astringent	wound healing	bark, leaf, seed
28	Oxalidaceae	<i>Averrhoa bilimbi</i> L.	ตะลิงปิง/ Cucumber tree	astringent, sour	expectorant	leaf, fruit
29	Pandanaceae	<i>Pandanus amaryllifolius</i> Roxb.	เตยหอม/ Pandan	cold	nourish	leaf, rhizome
30	Papilionaceae	<i>Derris scandens</i> (Roxb.) Benth. <i>Clitoria macrophylla</i> Benth.	เถาวัลย์เปรียง/ Jewel vine อัญชันป่า/ Pigeonwing	bitter bitter	tendon fever	vine root
31	Phyllanthaceae	<i>Phyllanthus emblica</i> L.	มะขามป้อม/ Indian gooseberry	astringent, sour, bitter	expectorant	fruit
32	Piperaceae	<i>P. pulcher</i> Wall. ex Mull. Arg <i>Piper retrofractum</i> Vahl. <i>P. nigrum</i> L. <i>P. sarmentosum</i> Roxb	ว่านธรณีสาร/ Tropical leaf-flower ตีปลีเสือก/ Javanese long pepper พริกไทย/ Black pepper ชะพลู/ Wild pepper	bland hot hot hot	fever expels gas in the stomach expels gas in the stomach expels gas in the stomach	root, tree/ plant flower fruit leaf
33	Primulaceae	<i>Ardisia polycephala</i> Wall. ex A.DC.	พิลังกาสง/ Wallich's coralberry	astringent	fever	fruit

Table 1 (Continued)

no.	family	scientific name	common name (Thai/English)	therapeutic plant flavors	medicinal properties	herbal parts
34	Rubiaceae	<i>Cinchona succirubra</i> Par.	ควินิน ต้นชิงโค่นา/ Quinine	bitter	malaria	leaf
		<i>Schizomussaenda dehiscens</i> Craib	บาวม้าเมียด/ Bao ma meud	bland	strengthening	tuber
		<i>Ixora lucida</i> R.Br. ex Hook.f.	เข็มดอกขาว/ Siamese white ixora	bland	fever	tree/ plant, leaf
		<i>Glycosmis pentaphylla</i> (Retz.) DC.	เขยตาย/ Gin berry	astringent	fever	root, leaf
35	Thymelaeaceae	<i>Aquilaria crassna</i> Pierre ex H.Lec.	กฤษณา/ Agar wood agarwood	cold	nourish	pith, tree/ plant
36	Vitaceae	<i>Cissus quadrangularis</i> L.	เพชรสังฆาต (สามร้อยต่อ)/ Four-angled vine	astringent	hemorrhoids	vine
37	Zingiberaceae	<i>Boesenbergia rotunda</i> (L.) Mansf	กระชาย/ Fingerroot Chinese ginger	hot	carminative	tuber, rhizome
		<i>Kaempferia parviflora</i> Wall. ex Baker	กระชายดำ/ Thai ginseng	hot	strengthening	tuber, rhizome
		<i>Zingiber zerumbet</i> (L.) Smith.	กระเทียม/ Pinecone ginger	bitter	expels gas in the stomach	tuber, rhizome
		<i>Curcuma zedoaria</i> (Christm.) Roscoe.	ขมิ้นอ้อย/ White turmeric	astringent	expels gas in the stomach	tuber
		<i>Alpinia officinarum</i> Hance	ข่าตาแดง/ Greater galangal	hot	expels gas in the stomach	tuber, rhizom
		<i>Z. ligulatum</i> Roxb.	ขิงแห้ง/ Dried-ginger	hot	expels gas in the stomach	tuber, rhizom
		<i>K. marginata</i> Carey ex Roscoe	เปราะป่า ว่านนกคุ้ม/ East Indian galangal	bitter and hot	fever	tuber
		<i>K. galanga</i> L.	เปราะหอมขาว/ Sand ginger	hot	fever	tuber, leaf
		<i>Curcuma</i> sp.1	พญาวาน/ Phyawan	bland	tendon	tuber, rhizom
		<i>Z. cassumunar</i> Roxb	ไพล/ Cassumunar ginger	astringent	expels gas in the stomach	tuber
		<i>C. xanthorrhiza</i> Roxb.	ว่านขมิ้นดลูก/ Emulawak, java ginger	astringent	endometritis	tuber
		<i>C. aeruginosa</i> Roxb.	ว่านใจดำ/ Pink and blue ginger	hot	expels gas in the stomach	root
		<i>C. xanthorrhiza</i> Roxb	ว่านทรหด/ Java ginger	hot	hemorrhoids	root
<i>Amomum villosum</i> Lour.	แว่นน้อย/ Tavoy cardamom	hot	expels gas in the stomach	fruit		
<i>Bustard cardamom</i> Tavoy	แว่นใหญ่/ Cardamom	hot	expels gas in the stomach	bark, fruit		

The app's users from academics, students, and the general public will subsequently be assessed and studied, with overall satisfaction being high (a mean of 4.65). The database issues received the highest degree of satisfaction (a mean of 4.90), followed by the ability to search quickly fulfills the criteria (mean of 4.80), with the least pleased issue being the quality and completeness of the data (a mean of 4.23) (Table 2).

Table 2 The findings of a user satisfaction survey based on the use of an herbal database.

item for evaluation	\bar{x}	S.D.	degree of satisfaction
A. Simplicity of usage	4.73	0.45	most satisfied
B. The appropriateness of the design, the usage of colors, and the employment of letters	4.67	0.48	most satisfied
C. Capability of searching	4.73	0.45	most satisfied
D. The capacity to search rapidly satisfies the requirements	4.80	0.41	most satisfied
E. The database is straightforward to use	4.90	0.31	most satisfied
F. The accuracy and completeness of the information	4.23	0.73	very satisfied
G. Information may be utilized to broaden one's knowledge base	4.67	0.48	most satisfied
H. The data gathered can be used as a reference	4.43	0.63	very satisfied
Total	4.65	0.54	

According to the study's conclusions, the samples were fairly pleased with the use of the herbal database (4.65). An herbal database system is used to collect scientific knowledge, therapeutic properties, and herbal components for use in a medical composition. The interesting may use short, concise search terms. It is also to avoid the village sage group's unique knowledge, identity, and links with medicinal plants from being lost and passed down from generation to generation. Users may quickly access information through the internet from anywhere and at any time using a range of devices. The independent t-test (Figure 5a) revealed that there was no statistically significant difference between the sample groups and the average acceptable degree (a p -value of 0.05). This implies that there was no difference in satisfaction with the app used to search for herb data among academics, students, and others based on these eight questions.

The one-way ANOVA test revealed a statistically significant difference in satisfaction with all eight items (A-H in Table 1) among the 30 users (Figure 5b), this suggests that the 30 users differed in their satisfaction with using the app to search for herbal data based on the 8 questions. Following that, the multiple-way ANOVA comparison test employing Turkey's criteria indicated that question F (The accuracy and completeness of the information) differed substantially from the other seven questions (p -value of 0.05). Users of the app were happy with the search query; nevertheless, they were the less satisfied with the accuracy and comprehensiveness of the information and separates itself from other concerns. It's possible that the users are educators. The information supplied may not be exactly what the user expects, and the user group used in the evaluation is a small sample group. However, in this study, a specific sample

group was chosen: those who want to use the material for educational reasons as a basis for future progress. According on the findings of this evaluation, this app was developed as a prototype, with plans to produce a new version by increasing the sample size and number of users.

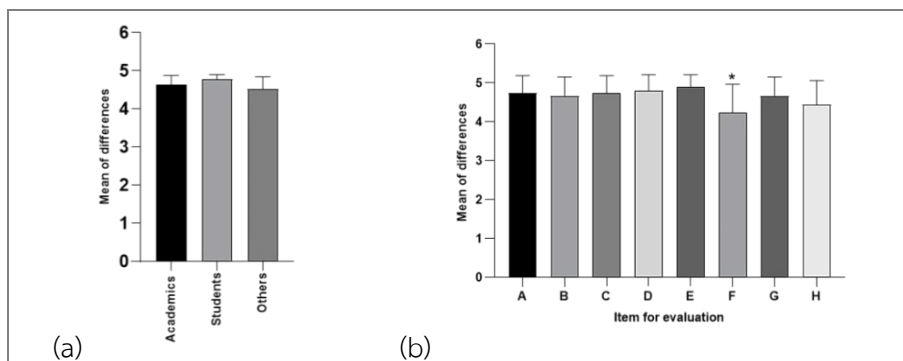


Figure 5 The SPSS program was used to perform statistical analysis and create visualizations. The dependent t-test was used to compare the average satisfaction of each sample group in a statistically significant manner (a). ANOVA multiple comparisons of satisfaction with the eight questions and 30 samples (b). The letter on the x-axis represents a question, as given in Table 2, and the * on the bar represents the significant difference between other groups. The statistical threshold of difference was reported at a p -value of 0.05.

Conclusions

The Cha-Uat Thai traditional medicine group collected information about herbal usage, including scientific and medical elements. The club used more than 5 plant species and plant components for blending. The specialty of the club is the use of plants of the Zingiberaceae family as raw materials in the club's medicinal formulas. Then, utilizing digital technology, design an app that is familiar to Android and iOS consumers. Users can do keyword searches using terms such as plant name, symptoms, or therapeutic characteristics. Utilize modern information-gathering technologies such as laptops, smartphones, and tablets. This application will aid in minimizing data loss and providing the user with access to information at all times and in all places.

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