

Qualitative Ethnobotany of Hermitism Karen in Ban Le Tong Ku, Unique Cultural Karen Community in Thailand

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ABSTRACT. – Ban Le Tong Ku is a Karen community comprising Pwo and Sgaw subgroups, each with its own distinct culture and traditions. Both subgroups adhere to the hermitism of the Talaku sect, a belief system that sets them apart from other Karen communities in Thailand. This raises the intriguing question of whether their ethnobotanical knowledge aligns with that of other Karen groups in Thailand. Qualitative ethnobotanical surveys involving six key informants revealed a total of 218 plant species used by the community: 145 by Pwo and 142 by Sgaw. The Fabaceae family stood out with the highest number of species utilized by both groups. Herbs and trees were the most commonly used plant types, with leaves being a predominant choice for both subgroups. Approximately two-thirds of the species served as food or traditional medicine, often prepared fresh or boiled. While Pwo and Sgaw shared knowledge on traditional plant use for 69 species, it is noteworthy that this knowledge was not exchanged between the two subgroups. For instance, *Phytocrene macrophylla* var. *macrophylla* was exclusively used for medicinal purposes by Pwo, whereas *Saraca thailandica* was solely utilized as food by Sgaw. Furthermore, this study represents the first documentation of ethnobotanical uses of *Phytocrene macrophylla* var. *macrophylla*, *Impatiens purpureoscorpoides*, and *Grewia multiflora* among the Karen community in Thailand.

KEYWORDS: qualitative ethnobotany, Pwo Karen, Sgaw Karen

INTRODUCTION

Thailand, situated in continental Southeast Asia, is renowned for its remarkable biodiversity, a result of its diverse geography and climate. The country's flora encompasses three distinct plant geography elements: the Indo-Burmese element, the Indo-Chinese element, and the Malesian element (Welzen et al., 2011). This diversity is reflected in Thailand's vast array of forests, contributing to its abundance of plant species. However, Thailand's richness extends beyond its plant species; it is also home to numerous ethnic groups, particularly in the northern regions. These ethnic communities, residing in rural areas, continue to rely on a multitude of plant species for various purposes, including food, medicine, and rituals. The enduring relationship between these ethnic groups and plants has resulted in a wealth of traditional plant use knowledge that has been transmitted across generations (Cao et al., 2020).

The Karen population constitutes the largest ethnic group in Thailand. Originating from Myanmar, the Karen migrated to Thailand around 200 years ago, settling predominantly in the northern and western provinces (Department of Social Development and Welfare, 2012). Within Thailand, the Karen ethnic group is subdivided into several subgroups, including Pwo, Sgaw, Pa-O, and Kayah, with their language belonging to the Sino-Tibetan language family (Department of Social Development and Welfare, 2012). Notably, Sgaw Karen and Pwo Karen are the primary subgroups in Thailand, often residing in

separate communities with significant linguistic distinctions. Sgaw and Kayah Karen people speak the Sgaw Karen language, while Pwo and Pa-O Karen people speak the Pwo Karen language (Ratanakul and Burusphat, 1995), limiting communication between Karen subgroups due to the language barrier (Depadung and Khammuang, 1997).

Karen communities are found in both highland and lowland natural forest areas. In northern provinces, Karen communities inhabit highland natural forest areas, while in western provinces, they predominantly reside in lowland natural forest areas. As a result, their daily lives are closely intertwined with the natural environment and local plant resources. Additionally, Karen people hold various beliefs and traditions connected to nature; for instance, they consider the forest sacred, as evidenced by the practice of tying a newborn's umbilical cord to a tree in the forest, symbolizing everyone's responsibility to care for it.

Numerous ethnobotanical studies have been conducted in Thailand, with a focus on Karen communities in the northern provinces (e.g., Kamwong, 2010; Kaewsangsai, 2017; Panyadee et al., 2018; Phumthum et al., 2020), while fewer studies have been conducted in Karen communities from the western province (e.g. Kantasrila et al., 2017). Most of these studies have concentrated on animist Karen communities.

Ban Le Tong Ku is a Karen community situated near the Thailand-Myanmar border, inhabited by Pwo and Sgaw Karen people who adhere to the hermitism

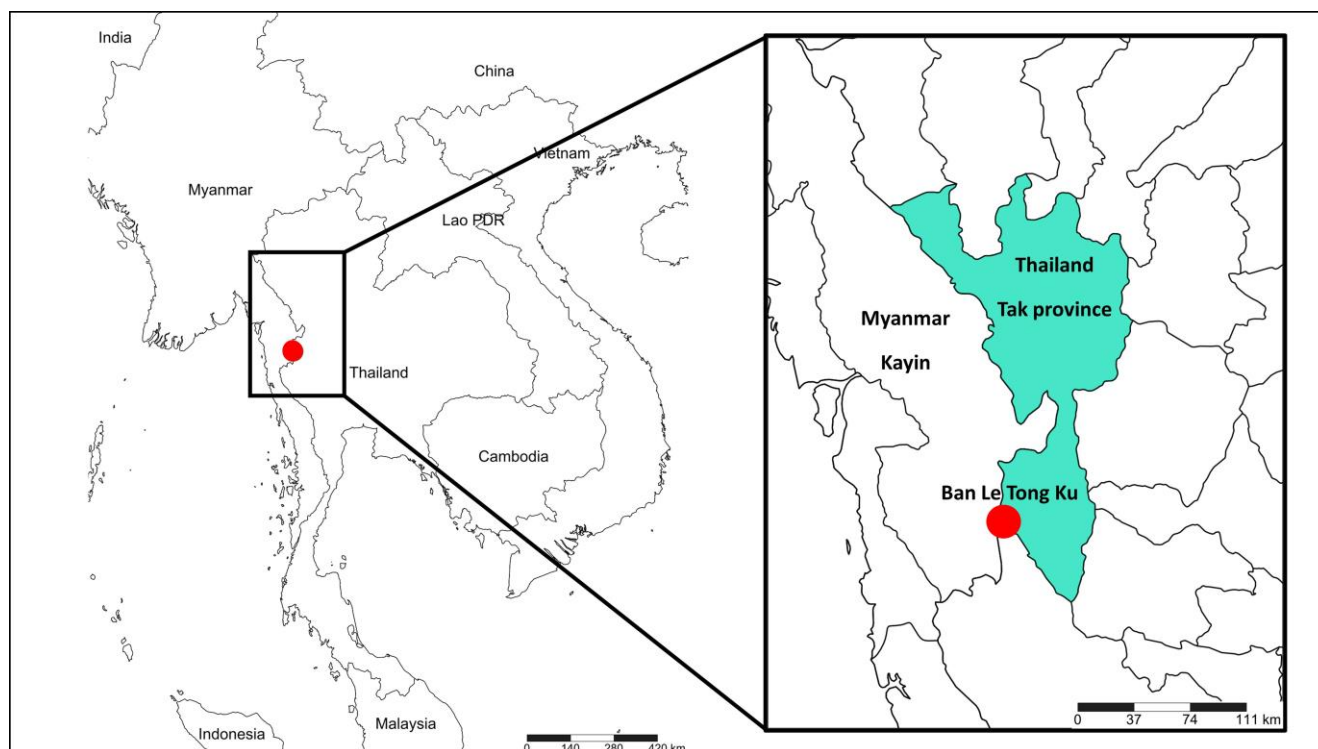


FIGURE 1. Map of Ban Le Tong Ku, Umphang District, Tak Province, Thailand.

of the Talaku sect (Khunthong, 2017). This community stands out due to its unique cultural practices, such as abstaining from consuming meat from livestock. Instead, they heavily rely on numerous plant species in their vicinity for various purposes, particularly for food and medicine. This long-standing interaction with plants suggests that the Karens in Ban Le Tong Ku possess extensive traditional plant knowledge.

The traditional plant use knowledge of ethnic groups can vary; for example, *Mimosa pudica* is used by several ethnic groups in Thailand, but the use category and pattern differ (Panyadee, 2022). Traditional beliefs inherited from ancestors play a crucial role in shaping plant use practices. Environmental factors and vegetation around communities may also significantly influence knowledge. Moreover, when different ethnic groups inhabit the same vegetation, they may adapt and utilize the same plant species for different purposes.

This study aims to compile the ethnobotanical knowledge of the hermitism Karen community in Ban Le Tong Ku. Additionally, it represents the first ethnobotanical investigation conducted within a hermitism Karen community in Thailand. The study seeks to examine whether the traditional plant use knowledge of the Karens in Ban Le Tong Ku differs from that of other Karen communities in Thailand. Furthermore, it aims to explore how the unique cultural and ecological conditions in Ban Le Tong Ku

contribute to any similarities or differences in their traditional plant use practices.

This study marks the first ethnobotanical investigation conducted within a hermitism Karen community in Thailand. Therefore, the aim of the present study is three folds. Firstly, it attempts to compile the qualitative ethnobotanical knowledge of the hermitism Karen community in Ban Le Tong Ku. Secondly, the study examines whether the traditional plant use knowledge of the Karens in Ban Le Tong Ku differs from those of other Karen communities in Thailand. Thirdly, it seeks to explore how the unique cultural and ecological conditions in Ban Le Tong Ku contribute to any similarities or differences in their traditional plant use practices.

MATERIALS AND METHODS

Study Site

The study was conducted in Ban Le Tong Ku (15° 42' 12.8658" N, 98° 34' 4.2852" E) (Fig. 1), located near the Thailand-Myanmar border within the Umphang Wildlife Sanctuary, Mae Chan sub-district, Umphang district, Tak Province. The village is situated in a valley surrounded by limestone mountains, approximately 230-260 meters above sea level, near the headwater of the Suriya River. It covers an area of

about 21 km² and is home to 1,000 inhabitants in 250 households. Ecologically, the region comprises tropical evergreen forest (lower montane forest) and riparian forests due to numerous small streams in and around the village. The population consists of two Karen ethnic subgroups: Pwo and Sgaw, both practicing the hermitism of the Talaku sect (Khunthong, 2017).

Selecting Key Informants

A consultation with the head of Ban Le Tong Ku was conducted to inform about the research objectives, seek permission to conduct the study, and identify key informants. Key informants were selected using a snowball method (Espinosa et al., 2012), which involved identifying individuals with specialized ethnobotanical knowledge, such as local healers and witch doctors (Amjad et al., 2020). The snowball method started with a recommendation from the head of Ban Le Tong Ku for the first key informant, with subsequent key informants being recommended by the previous ones, continuing until all relevant specialists in the community were included. Ultimately, six key informants were chosen, consisting of three Pwo Karens (one female and two males) and three Sgaw Karens (all males), all aged over 50 years.

Ethnobotanical Data Collection

Seven surveys on traditional plant uses were conducted every other month, covering each season, from December 2021 to January 2023. Ethical approval was obtained from the Research Ethics Review Committee for research involving human participants, specifically Group One at Chulalongkorn University (certificate reference number COA No. 145/65). Additionally, because the village is in a protected forest area, a research permit was obtained from the Department of National Park, Wildlife, and Plant Conservation (letter at Tor Sor 0907.4/22160 on 21 October 2022). The surveys for useful plants followed the walk-in-the-woods method (Abondo et al., 1991) and were conducted in various areas of Ban La Tong Ku, including home gardens, cultivated areas, and nearby protected forests. The key informants and a translator accompanied the researchers during each survey. The key informants were asked for the vernacular names of plants and their uses. Photographs of plants in their natural habitats and GPS locations were documented. Plant specimens were collected for species identification, and voucher specimens were prepared following the methods of the British Columbia Ministry of Forests (British Columbia Ministry of Forests, 1996). Taxonomic keys from the

Flora of Thailand, Flora of China, and Flora of Malesiana were used to identify plant species, and the voucher specimens were deposited at the Kasin Suvatabundhu Herbarium, Chulalongkorn University (BCU), and the Bangkok Forest Herbarium (BKF). The botanical names of the plant species have been updated according to Plants of the World Online (<https://powo.science.kew.org/>), and the status of the plants (native/exotic) was classified following the Thai plant names book (<https://botany.dnp.go.th/mplant/index.html>).

RESULTS AND DISCUSSION

Community and living conditions, traditions and rituals

Ban Le Tong Ku, located near the Thailand-Myanmar border, is surrounded by limestone mountains (Fig. 2A). The village is home to 1,194 people in 235 households, with 658 males and 536 females. The majority of the population belongs to the Pwo Karen and Sgaw Karen subgroups, both practicing the hermitism of the Talaku sect (Fig. 2B). Most Karen inhabitants are engaged in agricultural activities, including upland and lowland rice fields, durian plantations, and betel nut plantations (Fig. 2C-2F). Due to their belief in hermitism, they do not raise any livestock or consume meat from animals, considering it a sinful act. However, they occasionally consume fish caught from natural streams. The village also has civil services, including a Border Patrol Police school, a Suk Sala (a general health care center), a hydroelectric power plant, a mobile telecommunication tower, and a Border Patrol Police operation station (Fig. 2G-2H). The community's traditions and rituals are unique, differing from animist Karen communities. These include the tradition of paddy merit and merit for prolonging life, conducted annually in April. The tradition of paddy merit expresses gratitude to nature for providing food, with both Pwo and Sgaw Karens bringing rice and plants grown throughout the year to pay homage to nature (Fig. 3A). The tradition of merit for prolonging life stems from a legend about a Karen man who, after being refused priesthood due to a foreseen death, performed acts of kindness such as supporting a leaning tree with a staff (Fig. 3B), building a bridge over a river (Fig. 3C), and rescuing a fish in a drying pool (Fig. 3D). These acts are believed to lead to a longer life, and the Karens continue to perform them symbolically.



FIGURE 2. The community conditions. **2A.** the geography of Ban Le Tong Ku; **2B.** the hermit and his hermitage; **2C.** upland rice field.; **2D.** lowland rice field; **2E.** durian plantation; **2F.** betel nut plantation; **2G.** Suk Sala (a general health care center); **2H.** Border Patrol Police school.

Diversity of plant use

A total of 218 plant species were used by the Karen people in Ban Le Tong Ku. Pwo Karen used 145 species belonging to 128 genera and 64 families, while

Sgaw Karen used 142 species belonging to 130 genera and 62 families. Out of these, 151 were native plants and 67 were exotic plants (Supplement materials, Table S1). Notably, 69 species were used by both Pwo and Sgaw Karens, such as the consumption of betel nut



FIGURE 3. The tradition of paddy merit and merit for prolonging life. **3A.** the tradition of paddy merit; **3B.** the act of kindness by bringing staffs to support a leaning tree; **3C.** the act of kindness by building the bridge over a stream; **3D.** the act of kindness by releasing a fish to a natural stream.



FIGURE 4. Traditional plant use of *Calamus arborescens* leaves for thatching. **4A.** *C. arborescens* grows along the banks of the natural stream in betel nut plantation areas.; **4B.** *C. arborescens* petioles with flattened, triangular, black spines; **4C.** *C. arborescens* leaves with silvery grey on lower surface and inflorescences; **4D.** A bunch of *C. arborescens* leaves; **4E-4F.** making of thatches from *C. arborescens* leaves; **4G.** a stack of thatches in the process of flattening and drying.; **4H.** thatches installed on the Karen house roof.

(fruit of *Areca catechu* and leaf of *Piper betle*), the use of the tuber of *Amorphophallus muelleri* in cooking local vegetarian food and of bark of *Donax canniformis* in weaving tools. An interesting difference was observed in the use of *Calamus arborescens* (Fig. 4) by the Karen people in Ban Le Tong Ku for thatching

roofs, unlike other Karen communities in the northern provinces that use *Imperata cylindrica* (Winijchayan, 1995; Sukkho, 2008; Kamwong, 2010). This difference in plant use knowledge is influenced by geographic and vegetation differences in their communities.

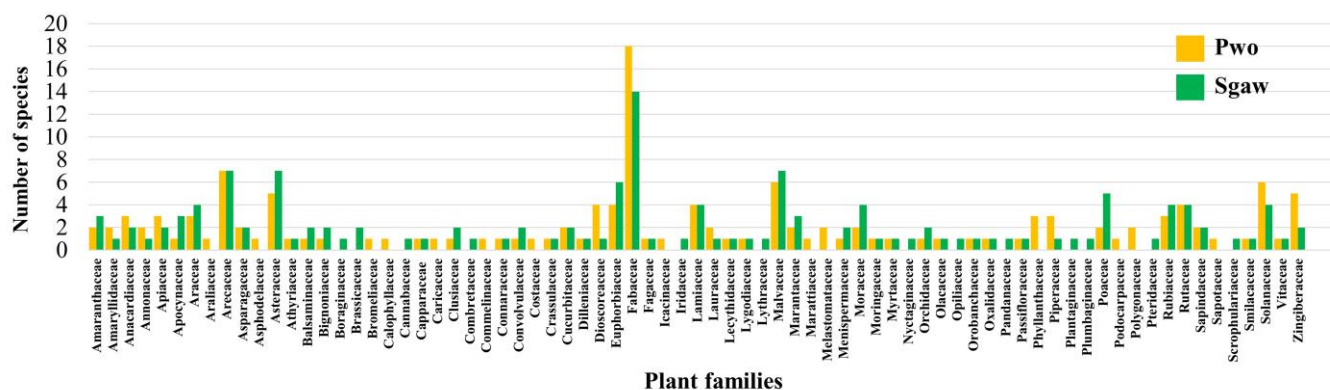


FIGURE 5. Plant families and number of species utilized by both Karen subgroups.

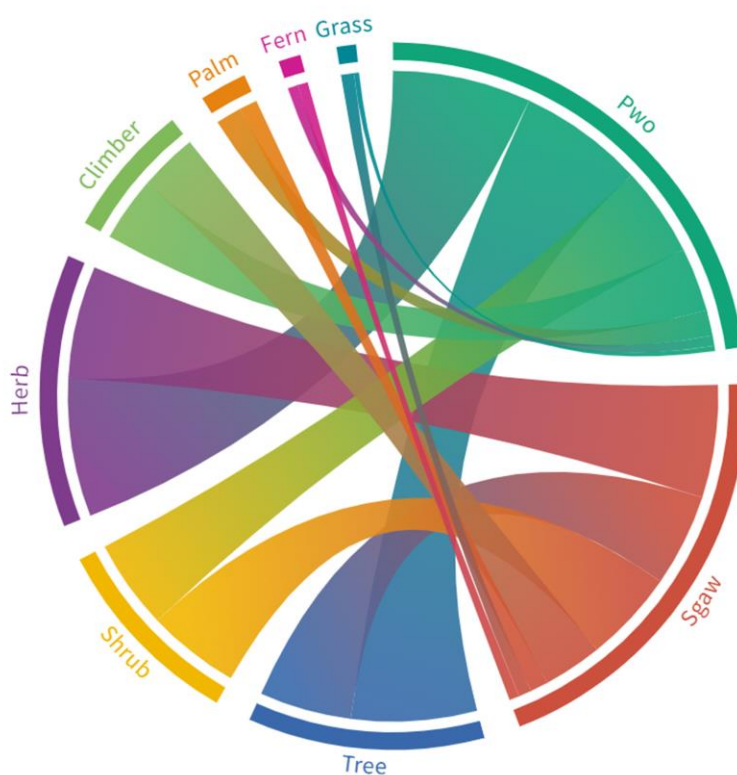


FIGURE 6. Habits of useful plants known by both Karen subgroups.

Plant families

In total, 79 plant families were found in Ban Le Tong Ku (Fig. 5), with Fabaceae being the family with the highest number of species utilized by both Pwo and Sgaw Karens. This was followed by Arecaceae, Malvaceae, Asteraceae, Euphorbiaceae, and Solanaceae. Fabaceae is known for its diversity and pantropical distribution, with many species used by ethnic communities for food and medicine. The findings regarding plant families in Ban Le Tong Ku are consistent with other ethnobotanical studies (e.g.

Sutjaritjai et al., 2019; Hein et al., 2023; Sarkar et al., 2023; Tahir et al., 2023), highlighting the importance of these families in the traditional plant use of the Karen people.

Plant habits

Herbs were the most prevalent among the plant habits used by both Pwo and Sgaw Karen, followed by trees, shrubs, climbers, palms, ferns, and grasses (Fig. 6). This preference is attributed to the surrounding evergreen forest that is rich in these plant types.

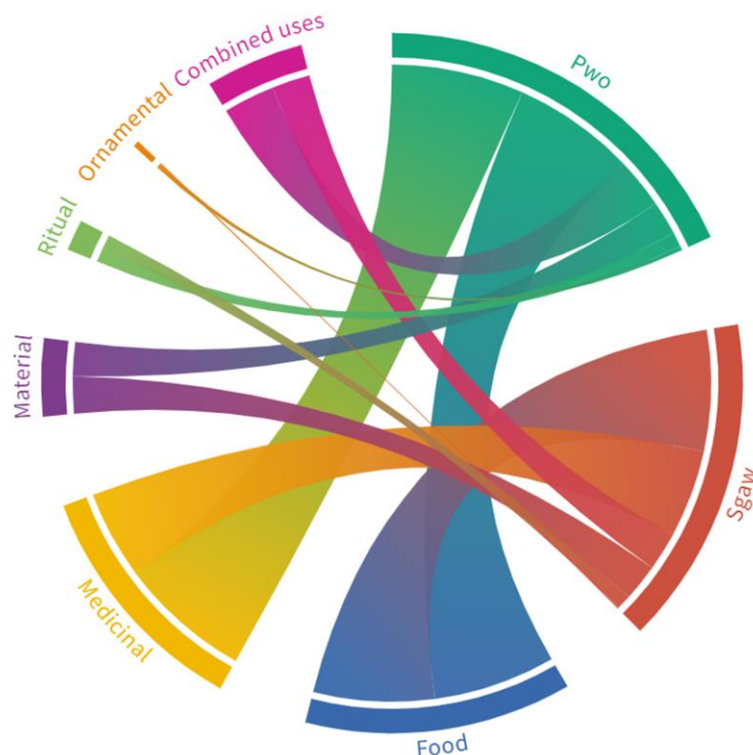


FIGURE 7. Habits of useful plants known by both Karen subgroups.

Similar findings have been reported in other ethnobotanical studies e.g. Dewi et al. (2023), Gautam and Adhikari (2023), indicating the reliance of rural communities on herbs and trees for various purposes. It is noteworthy that, unlike other Karen communities, Karens in Ban Le Tong Ku hold the belief in using only leaves from trees or shrubs to pay homage to sacred objects, for example, leaves of *Durio zibethinus* (a tree) and *Codiaeum variegatum* (a shrub) in the tradition of paddy merit and merit for prolonging life. Leaves from climbers or herbs are deemed to be not appropriate in such traditions.

Plant used categories

Medicinal purposes were the most commonly used category in Pwo Karen, followed by food, combined uses, materials, rituals, and ornamental purposes whereas food was the most prevalent used category in Sgaw Karen (Fig. 7). Similar findings have been reported in other ethnobotanical studies (e.g. Mon et al., 2020, Luczaj et al., 2021), indicating the reliance of rural communities on various plant species in their surrounding for food and medicinal uses. This finding also highlights the extensive traditional knowledge on medicinal plant uses in Karen in Ban Le Tong Ku to cope with day-to-day health problems.

Plant parts used

Leaves were the most commonly used plant part by both Pwo and Sgaw Karens, followed by fruits, whole plants, stems, bark, flowers, roots, and seeds (Fig. 8). Leaves are preferred for their higher concentration of secondary metabolites and ease of gathering. This pattern is consistent with findings from other ethnobotanical studies, e.g. Junsongduang et al. (2014), Aththorick and Berutu (2018), Aboukhalaf et al. (2022).

Mode of Preparation

Fresh and boiled were the common modes of preparation used by both Karens (Fig. 9), especially for medicinal purposes. Fresh plant parts are consumed directly, while boiling is used to extract active ingredients for easy ingestion. This finding is consistent with other ethnobotanical studies, e.g. Nikesh and Maddi (2023), indicating the importance of these preparation methods in traditional plant use.

Examples of interesting plants used

In addition to commonly used plants, several interesting instances were found in Ban Le Tong Ku. For example, *Physalis angulata* (Fig. 10A) is used to

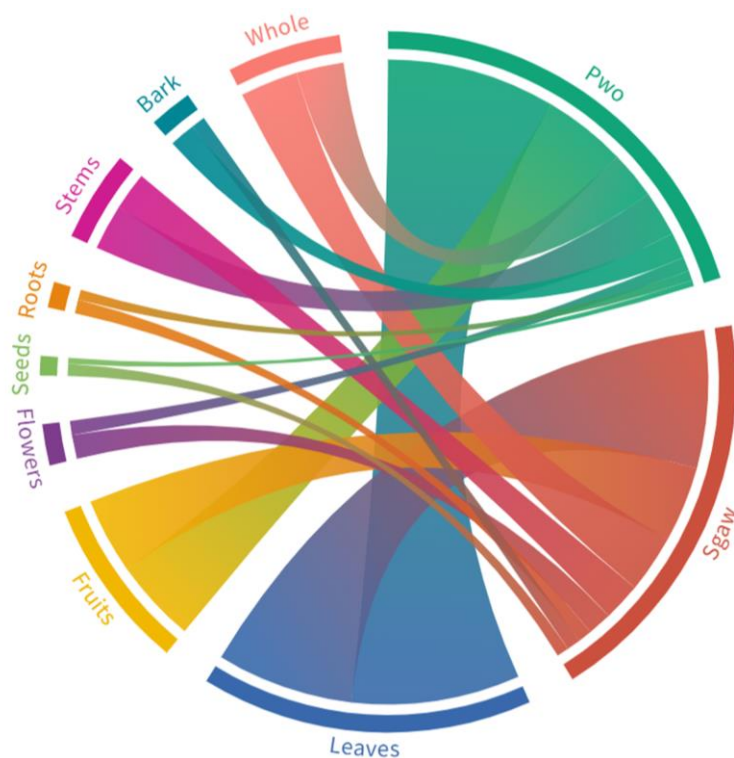


FIGURE 8. Plant parts used by both Karen subgroups.

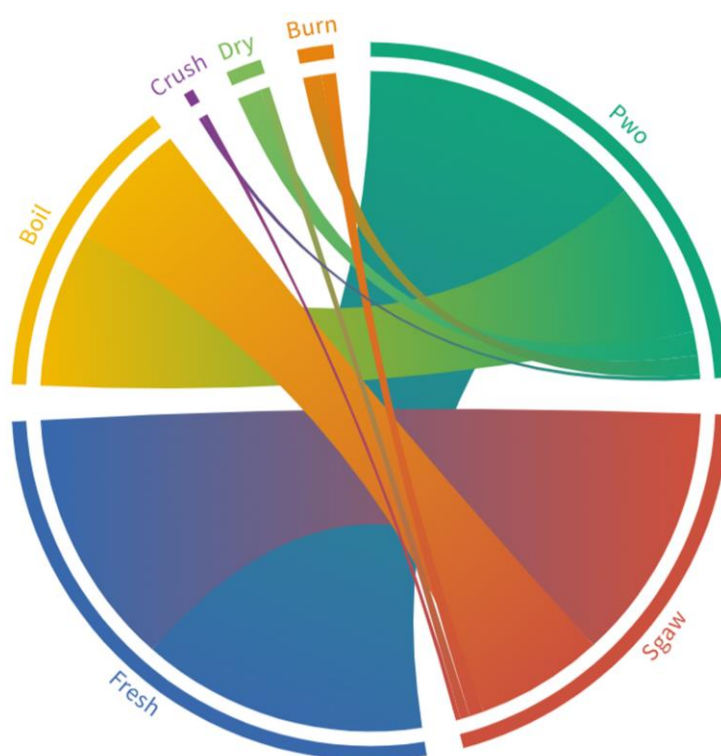


FIGURE 9. Mode of plant preparations used by both Karen subgroups.

treat malaria fever by boiling the whole plant and drinking the boiled water. Powder from *Curcuma longa* (Fig. 10B) rhizomes are scattered during the paddy merit and merit for prolonging life ceremonies. *Fissistigma rubiginosum* (Fig. 10C) leaves are used to

wrap a local dessert, enhancing its aroma. Some plant uses were limited to one Karen subgroup, such as the use of *Saraca thailandica* (Fig. 10D) seeds and *Peristylus goodyeroides* (Fig. 10E) inflorescence by Sgaw Karen for cooking and to pay homage to sacred

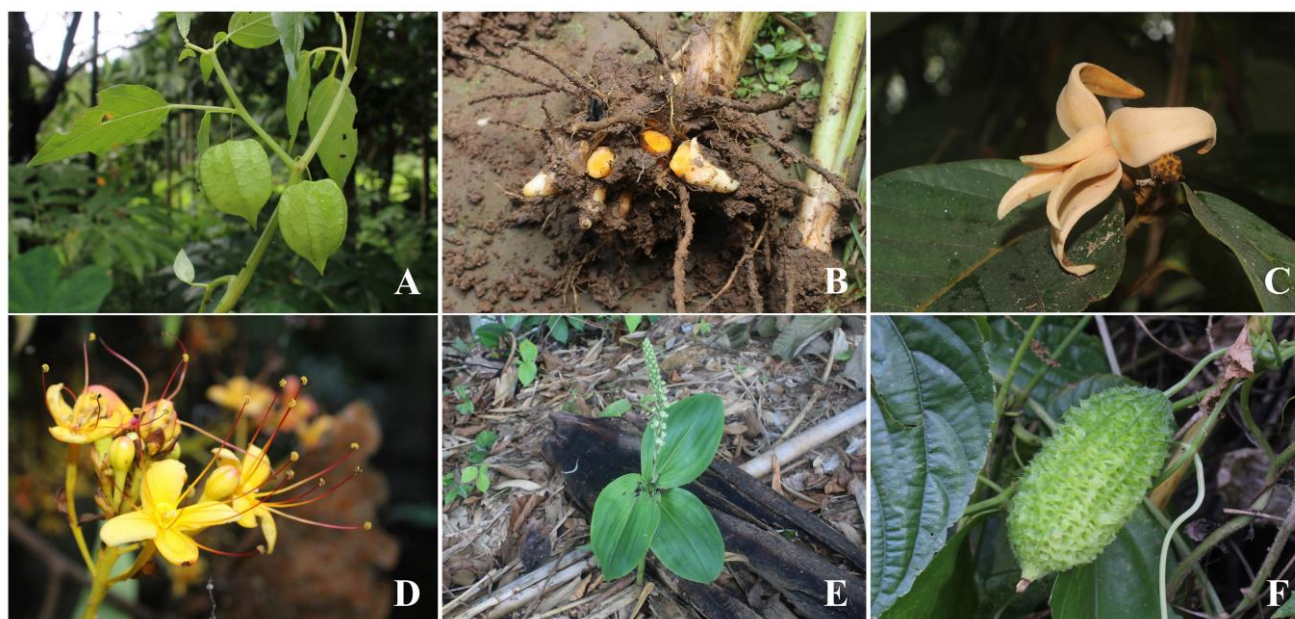


FIGURE 10. Examples of noteworthy plants used by both Karens. **A.** *Physalis angulata*; **B.** *Curcuma longa*; **C.** *Fissistigma rubiginosum*; **D.** *Saraca thailandica*; **E.** *Peristylus goodyeroides*; **F.** *Thladiantha cordifolia*.

objects, respectively, and the use of *Thladiantha cordifolia* (Fig. 10F) fruit by Pwo Karen as a side dish. These differences in plant use highlight the influence of ethnicity on traditional plant knowledge.

First report of plant use species by Karen people in Thailand

Three plant species used by the Karen people in Ban Le Tong Ku had never been reported in Thailand before. These include *Impatiens purpureoscorpoides* (Fig. 11A-11B), *Phytocrene macrophylla* var. *macrophylla* (Fig. 11C-11D), and *Grewia multiflora* (Fig. 11E-11F). These findings suggest that many plant species used by the Karen people in Thailand have not been documented, especially in border areas where plants from neighboring countries may also be used.

CONCLUSIONS

A total of 218 plant species were found to be used by the Karen people in Ban Le Tong Ku. These species were divided into 145 species belonging to 128 genera and 64 families, recorded as being used by Pwo Karen, and 142 species belonging to 130 genera and 62 families, recorded as being used by Sgaw Karen. Additionally, 151 species were identified as native plants and 67 as exotic plants. The results of this study

indicate a close relationship between both Karen groups and local plants, which are utilized for various benefits in their daily lives. Moreover, the use of certain plants appears to be specific to ecological conditions and patterns of belief. While Pwo and Sgaw Karen shared traditional plant knowledge for a total of 69 species, there were instances where the exchange of traditional plant knowledge between the two subgroups did not occur. Notably, three useful plant species had not previously been reported as being used by the Karen people in Thailand. This novel information enhances our understanding of plant use knowledge among the Karen people in Thailand.

Our study also highlights the impact of changes in livelihood, such as compulsory education, language shift, modernized healthcare practices, household vocations, food availability, acceptance of Christianity, and the diminishing belief in hermit practices, on traditional plant use knowledge among both Karen subgroups. Therefore, conducting a quantitative ethnobotanical study to observe the trend of knowledge change and identify important plant species becomes crucial for further research. The data obtained from this qualitative study can be used for collaborative plant conservation planning between the community and government agencies. Additionally, certain plants may have the potential to be developed as food products or new medicines.



FIGURE 11. First report of plant species used by Karen people. **A.** a flower of *Impatiens purpureoscorpoides*; **B.** a Sgaw Karen wears fresh flowers of *I. purpureoscorpoides* in her hair; **C.** infructescence of *Phytocrene macrophylla* var. *macrophylla*; **D.** male inflorescence of *P. macrophylla* var. *macrophylla*; **E.** flowers, fruits and leaves of *Grewia multiflora*; **F.** the stems (arrow) of *G. multiflora* showing the scar after bark was removed.

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