ASIAN JOURNAL OF ETHNOBIOLOGY
Volume 5, Number 1, May 2022
Pages: 44-51

E-ISSN: 2580-4510
DOI: 10.13057/asianjethnobiol/y050105

An ethnobotanical study of plants used in socio-religious activities in Bhutan

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Manuscript received: 9 March 2022. Revision accepted: 15 April 2022.

Abstract. *Jigme, Yangchen K. 2022. An ethnobotanical study of plants used in socio-religious activities in Bhutan. Asian J Ethnobiol 5: 44-51.* Ethnobotany encompasses all elements of plants' natural and direct interaction with humans. Plants have been linked to human civilization since antiquity. Like Hindu people, Buddhists worship plants or use their components in different ways to perform various socio-religious ceremonies. However, this indigenous knowledge is diminishing rapidly due to the disinterest shown by the younger generation. Therefore, there need to document this indigenous knowledge regarding the usage of religious plants. The present study was conducted in Kanglung Gewog under Trashigang Dzongkhag, Bhutan, to document the plant species used for religious purposes. The ethnobotanical data were collected through semi-structured telephone interviews. A total of 24 plant species belonging to 16 families and 22 genera used in religious practices were documented. Among the 16 families, the most utilized species belong to the family Poaceae (4 species), followed by the family Ericaceae and Cupressaceae (3 species each) and Pinaceae (2 species). Out of these, trees account for 58 percent of all plants reported, followed by herbs (25%), shrubs (13%), and climbers (4%). The tree's trunk's most utilized parts, followed by the leaves, whole plant, seeds, and fruits. The majority of the plants recorded (58%) are used for religious ceremonies, and 42 percent of the plants are used for making religious items. The people of Kanglung have extensive indigenous knowledge on using plants in socio-religious activities. Still, rapid socio-economic development and the disinterest of the younger generation have become a major threat to preserving this indigenous knowledge. Therefore, it is necessary to preserve this indigenous knowledge on using plants in socio-religious activities by proper documentation and identification of plant species used to save these plants from further loss and sustainable utilization.

Keywords: Ethnobotany, indigenous knowledge, Kanglung, plants, rituals, socio-religious activities

INTRODUCTION

Bhutan has rich biodiversity and is home to a diverse array of flora and fauna, including 5603 species of vascular plants, 400 lichens, 200 mammals, and about 700 birds (NBC 2011). Bhutan is a country with the strongest traditions of conservation of nature and the environment, which is also reflected in the constitution.

Natural resource conservation has been a vital part of many indigenous cultures throughout the world (Niroula 2016). Bhutan's natural biological history has been conserved through the millennia due to the kings' farsightedness and strong laws and policies. Apart from these, religious traditions have also played a significant role in environmental conservation. The major heritage of environment conservation is the dedication of areas of forest or groves to various deities and spirits by the rural peoples, and sometimes conservation for the rituals (Geng et al. 2017). The indigenous people are illiterate, but they have carefully preserved their ancient practices, folklore, rites, and way of life in the forest through folk beliefs (Brahma et al. 2014).

Plants have played an important role in human civilization for a long time. Humans have recognized their reliance on plants since the beginning of time, primarily for food, construction materials to build houses (shelter), clothing, and the main ingredient of health care (medicine) (Geng et al. 2017; Moallem et al. 2017; Jima and Megersa 2018; Chhetri et al. 2019; Purushothaman et al. 2020; Bailly 2021). Aside from these basic human needs, the plants are deeply entwined with religions such as Buddhism and Hinduism. According to Chhetri et al. (2019), there is almost no religious ritual in Hinduism or Buddhism that does not require plants or plant parts. In addition, several plants are part of various ritual purposes and are a source of livelihood for the local people (Geng et al. 2017). Thus, people's religious beliefs have played a significant role in developing views of nature and defining relationships of man's role in nature, thereby establishing a link between religious life and natural systems. Such beliefs and practices can help to rethink and respond to the world's environment and the management of natural resources (Niroula 2016).

The people are deeply religious, practicing Buddhism, Hinduism, and Christianity. However, most people practice Buddhism as their primary religion (Sharma 2016). In Buddhism, people engage in various religious activities throughout the year, where the plants have their own distinct roles and significance (Namsa 2011). Plant parts like bark, twigs, leaves, flowers, fruits, branches, and seeds are used. Man's intimate relationship with plants has helped men develop a sense of reverence for nature and natural resources (Chhetri et al. 2019). They added that almost no religious ceremony in Hinduism or Buddhism does not

involve the use of plants or plant components. However, in Buddhism and Hinduism, plants or plant components are employed in various religious rituals. People worship, perform rituals, make offerings, and make religious items using whole plants or plant components such as flowers, leaves, trunk, bark, and roots.

According to Pandey and Pandey (2016) the *Aegle marmelos* are thought to be related to Lord Shiva, and the ladies of the Indo Gangetic plain used to worship this tree to have their aspirations realized. Similarly, *Ocimumten uiflorum*, popularly known as "Tulsi", is related to the holy event "Tulsi Vivah", which is the ceremonial marriage of Tulsi with Lord Vishnu, and it is also said to be an incarnation of goddess Lakshmi (goddess of knowledge) (Pandey and Pandey 2016). Furthermore, Doburuie (Assamese tribes) utilize Piro grass, bamboo, and many other holy plants leave to prepare the temporary altar, *Thelypteris angustifolia* (wild fern), *Imperata cylindrica* (sharp grass), and a split bamboo are put on the altar facing the rising sun (Sharma and Pegu 2011). Gupta (1971) stated that trees have an important role in the Bible and Korean religion. Twenty-two trees were used such as *Amygdalus communis, Prunus dulcis, Malus domestica, Ceratonia siliqua, Cupressus sempervirens, Phoenix dactylifera, Diospyrose benum, Ficus carica, Boswellia* sp., *Aquilaria* sp., *Quercus* sp., *Pinus* so., *Pistacia vera, Platanus orientalis, Punica granatum Populus euphratica, Ficus sycomorus*, *Tamarix* sp., *Pistacia atlantica, P. terebinthus, Tetraclinis articulate*, *Juglans regia*, and *Salix* spp. He added that the finest exudation used to make incense comes from *Balsamodendron* sp., *Aquilaria agallocha*, *Shorea robusta*, and *Pinus deodara*. Similarly, the *Areca catechu* flower is used in marriage rituals in South India and Gujerat, while *Euphorbia* sp. is considered holy to the goddess of snakes and is donated in temples by people in Bengal and South India.

Similarly, Sarma and Devi (2015) documented that 54 species with religious importance, such as *Cynodon dactylon*, *A. marmelos*, *Ocimum sanctum*, and *Piper betle* are solely employed in all Hindu religious ceremonies from Nalbari and Sonipur districts in Assam. Important species used for Prasad preparation during a religious ceremony include *Vigna radiata*, *Cicer arietinum*, *Mangifera indica*, *Musa* sp., *Saccharum officinarum, Cocos nucifera*, and *Zingiber officinale*. *Musa balbisiana* (banana) is a very holy tree that represents Lord Vishnu, and its fruit is dedicated to Lord Vishnu and Laksmi (god of wealth) in exchange for a happy married life and a prosperous financial situation (Pandey and Pandey 2016). Similarly, Chhetri et al. (2019) added many plants, such as *Ficus religiosa*, *Azadirachta indica*, *O. sanctum*, *Centella asiatica*, *Curcuma longa*, and *C. dactylon* have divine properties and are thus employed in a variety of religious activities and rites in Hinduism.

Buddhists view *Oroxylum indicum* as the most sacred plant because its flower buds open at night and fall before daylight and are not even touched by bees, indicating its purity. Its seeds, resembling paper silk, are used in every auspicious ceremony (Chhetri et al. 2019). According to Namsa et al. (2011), the Monpas (ethnic group) of Arunachal Pradesh have long used *Daphne papyracea* to make handmade paper for painting and writing holy scripts in Buddhist temples. The sweet-scented blossoms of *Daphne bholua*, a member of the Thymelaceae family, are used as gifts in temples (Gupta 1971). In research conducted by Hongmao et al. (2002), the woods of *Tectona grandis*, *Artocarpus heterophylla*, and *Gmelina arborea* were utilized to create sculptures in Xishuangbanna, one of the most biologically diverse places in southwest China. The oil extracted from the seeds of *Mesuaferrea* sp. and *Aleurites moluccana* was also used to light the temple, and plants such as *Nymphaea lotus*, *Hedychium chrysoleucum*, *Crinum asiaticum*, and tropical fruits such as *Annona reticulata*, *Citrus grandis*, and *M. indica* were used as offerings at Buddhist ceremonies and are also served as a daily food for monks at the temple (Hongmao et al. 2002). Weckerle et al. (2011) added *C. funebris*, *Gaultheria fragrantissima* and *Ligustrum sempervirens* are used for incense and joss stick production in Southwest China.

The use of plants in religious activities is mentioned in religious literature and has been passed down from generation to generation, primarily through religious leaders and parents to their children by word of mouth (Pandey and Pandey 2016). However, due to modernization and the influence of Western culture, younger generations are less concerned with such belief systems and practices, and they are also less interested in understanding religious literature. Several workers have made a significant contribution to the ethnobotany from various parts of the world (Rana et al. 2016). For example, researchers such as Brahma et al. (2014) reported 48 species of plants from 36 families, Chhetri et al. (2019) reported 74 species from 44 families; Geng et al. (2017) reported 32 species from 17 families; Niroula (2016) reported 69 species from 34 families; Pandey and Pandey (2016) reported 9 species from 9 families; Pangging et al. (2019) reported 61 species from 33 families; Rana et al. (2016) reported 36 species; Debbarma et al. (2014) reported 59 species from 42 families; Sharma and Pegu (2011) reported 30 species from 23 families; Singhal et al. (2017) reported 30 species from 22 families; Staub (2011) reported 24 species from 16 families; Weckerle et al. (2011) reported 17 species, and Wijana et al. (2020) reported 46 species of plants with socio-cultural and religious beliefs.

Numerous studies have documented different plants from India, China, Nepal, and Indonesia with socio-cultural and religious beliefs, however, there has been very little documentation from Bhutan. Furthermore, proper scientific research and documentation in this field are critical. Like many other developing nations, ethnobotany is a relatively new topic of study in Bhutan. People who live in rural regions have a strong relationship with their surroundings' natural resources and have firsthand knowledge of the numerous applications of plants that they require. In Bhutan, only a few researchers, such as Wangchuk et al. (2016) and Wangchuk and Tobgay (2015), have studied the medicinal plants in Bhutan, however, the religious elements of plants are not given any attention and are not well researched. Therefore, an attempt has been made to

study all sacred plants used by the people of Kanglung Gewog (an administratively demarcated region constituted by many villages) under Tashigang Dzongkhag (District), with a particular focus on how the plants are used in various religious activities.

MATERIALS AND METHODS

Study area

The present study was conducted in the Kanglung Gewog under the Trashigang District, Bhutan. Kanglung Gewog lies in 27°17′13.743″N latitude and 91°31′27.725″E longitude, situated at an altitude of 1830 meters above sea level. Temperatures in the summer vary from 16°C to 24°C, while temperatures in the winter range from 3°C to 13°C. It has a land size of 63.30 square kilometers and is bordered by Dremitse Gewog in Mongar District. Kanglung comprises eight villages (Pangthang, Ritsangdoong, Maanthong, Mertsham, Thragom, Yonphoopam, Yonphoola, and Rongthoong), totaling 5453 inhabitants. People practice Buddhism as their primary religion. The study area is shown in Figure 1.

Study population

The research population consisted of 31 people; three participants from each village (8 villages), three lay monks (Gomchen*)*, and four monks from Yonphula Dratshang and Kanglung Shedra knowledgeable about the plants utilized in different religious activities.

Data collections

Telephone interviews were used to acquire information about the use of several plant species in religious events in the community. The field visit and physical data collection were not feasible due to COVID-19 restrictions and subsequent lockdown in the country. However, the plants are photographed and presented as an annexure. Data was gathered via a semi-structured questionnaire. The head of the family was interviewed, however, in the absence of the head of the family, other elder members were interviewed. The interviews were held in the local language (*Sharchop*). The telephone interview included 31 informants (20 men and 11 females). Individual plant data such as local name, botanical name, common name, family, habit and habitat, plant part(s) utilized, and usage mode was documented. The plant species are identified and classified using the book Flora of Bhutan by A. J. C. Grierson and D. G. Long.

RESULTS AND DISCUSSIONS

The current study documented 24 plant species from 22 genera and 16 families associated with socio-cultural and religious beliefs among people residing in the Kanglung Gewog under Trashigang District. Plant species are listed alphabetically, along with their botanical names, families, local names, parts utilized, and usages are given in Table 1 and Figure 6. Among the 16 families, the most utilized species belong to the family Poaceae (4 species), followed by the family Ericaceae and Cupressaceae (3 species each) and Pinaceae (2 species) (Figure 2). Trees account for 58 percent of all plants reported, followed by herbs (25%), shrubs (13%), and climbers (4%) (Figure 3). The tree's trunk is the most commonly utilized plant part, followed by the leaves, whole plant, seeds, and fruits (Figure 4).

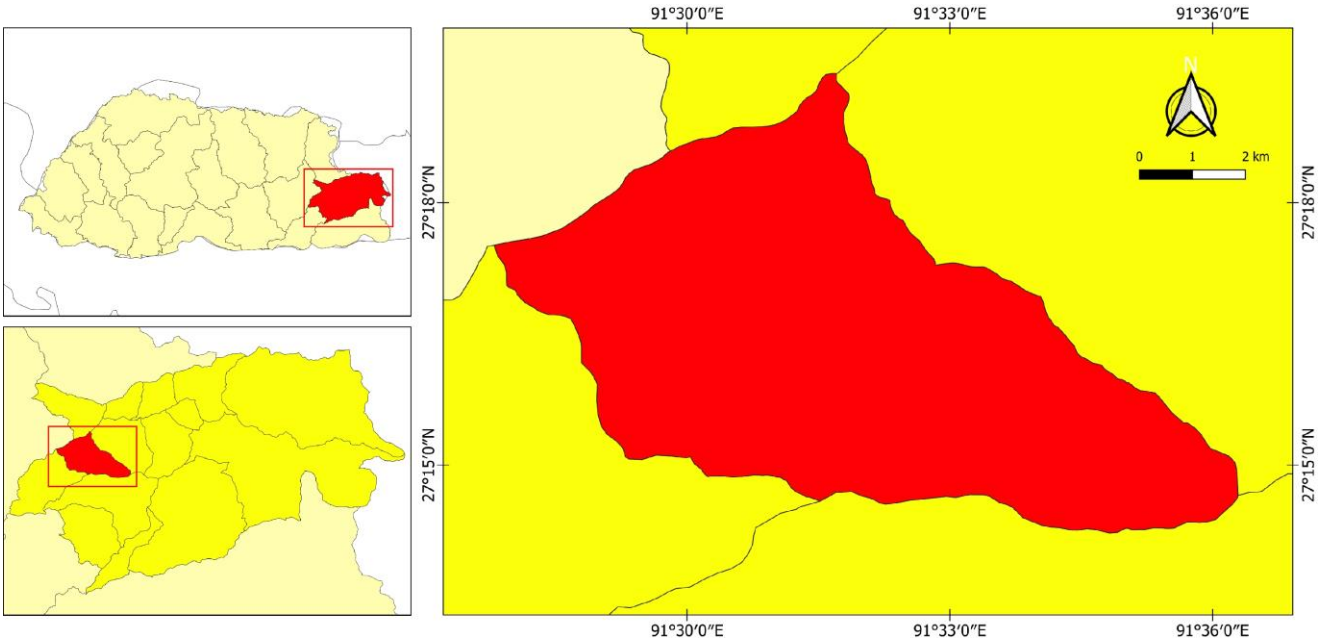


Figure 1. Map of Kanglung, Trashigang District, Bhutan

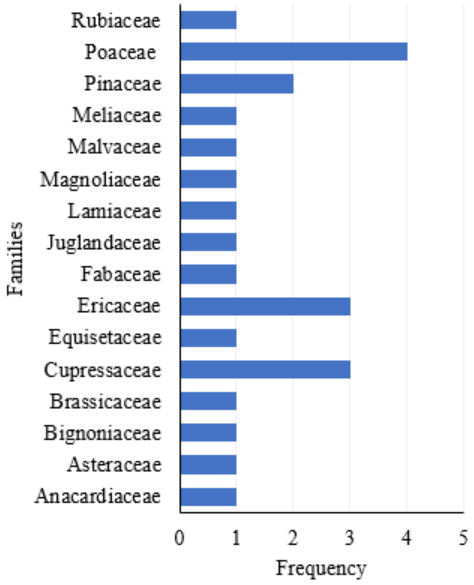


Figure 2. Use of plants based on families

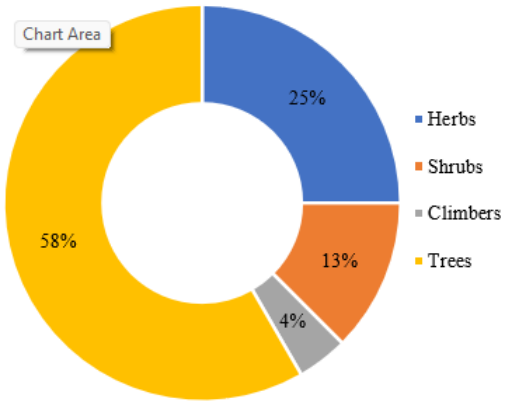


Figure 3. Use of plants based on the habit

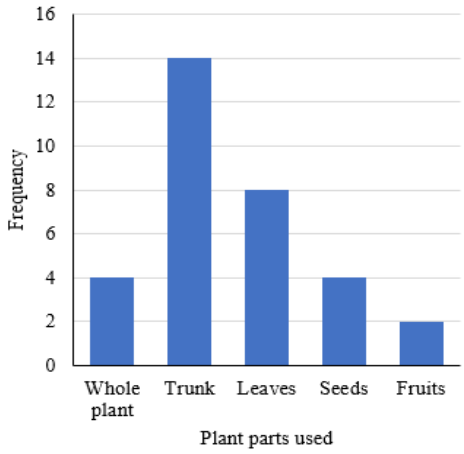


Figure 4. Frequency of plant parts used

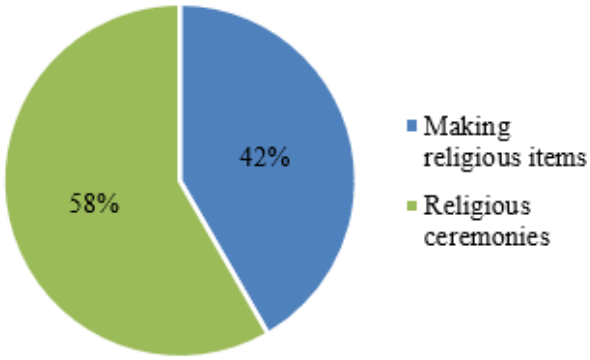


Figure 5. Plants used in religious activities

Plants used in the religious activities

Humans regard themselves as distinct people, each with distinctive ideas, habits, interests, and eccentricities (Niroula 2016). People's religious beliefs have played an important part in shaping perceptions of nature and defining man's connection with nature, establishing a link between religious life and natural systems.

Based on the mode of utilization, the plant species used in religious activities can be grouped into two categories: making religious items and religious ceremonies. The majority of the plants recorded (58%) are used for religious ceremonies, and 42% of the plants are used to make religious items (Figure 5). Out of 24 useful plant species documented in the Kanglung gewog, there were 13 plant species such as *Artemisia vulgaris*, *Bambusa vulgaris*, *Brassica campestris*, *Cryptomeria japonica*, *Equisetum arvense*, *Oryza sativa*, *G. fragrantissima*, *Rubia manjith*, *Zea mays*, *Pinus bhutanica*, *Pinus roxburghii*, *Triticum aestivum* and *O. Indicum* that were utilized in the religious ceremonies including rituals. These plants are used to make smoke offerings, burnt as incense, on prayer flag poles, and to ward off evil spirits during rituals. The other 11 plants species such as *Bombax ceiba*, *Erythrina arborescens*, *C. corneyana*, *J. regia*, *Juniperus recurva*, *Magnolia champaca*, *Rhus chinensis*, *Rhododendron ciliatum*, *Rhododendron setosum*, *Toona ciliata*, and *T. grandis* were used for making religious materials/items such as an incense stick, mask for mask dance and altar. Table 1 shows the specific applications of the plants.

Table 1. Plants species used by the people of Kanglung in their socio-cultural and religious activities

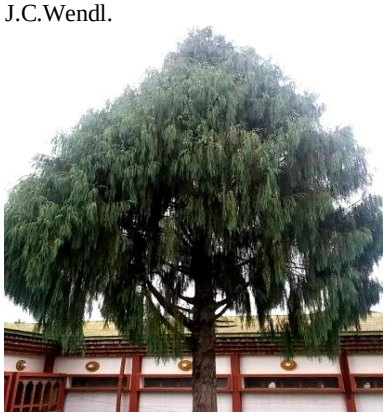
Botanical name	Common name	Local name	Family	Habit	Part(s) used	Usage
Artemisia vulgaris L.	Mugworts	Mey-reng-ma	Asteraceae	Herb	Whole plant	Used during rituals as a smoke offering (*Sang*).
Bambusa vulgaris Schrad. ex J.C.Wendl.	Bamboo	Leshing	Poaceae	Tree	Trunk	Used as a prayer flag pole.
Bombax ceiba L.	Silk-Cotton	Pema Gayser Shing	Malvaceae	Tree	Fruits & trunk	Cotton from the fruits is used to make wicks for lighting butter lamps during rituals, and the trunk is used to make a mask for the mask dance.
Brassica campestris L.	Mustard	Memba	Brassicaceae	Herb	Whole plant	Used during ritual to drive away the evil spirit.
Cupressus corneyana Knight & Perry ex Carrière	Weeping Cypress	Tsenden Shing	Cupressaceae	Tree	Trunk & Leaves	The trunk makes incense, while the fresh leaves are burned as a smoke offering (*Sang*) during rituals.
Cryptomeria japonica (Thunb. ex L.f.) D.Don	Japanese cedar	-	Cupressaceae	Tree	Leaves	Burnt as incense during religious rites.
Equisetum arvense L.	Common Horsetail	Nurchung	Equisetaceae	Herb	Whole plant	Used during rituals.
Erythrina arborescens Roxb.	Coral Tree	Kharshing	Fabaceae	Tree	Trunk	Used for making a mask for the mask dance.
Gaultheria fragrantissima Wall.	Wintergreen	Shagshing -ma shing	Ericaceae	Shrub	Leaves	During the ritual, fresh leaves and twigs are burned as a smoke offering (*Sang*).
Juglans regia L.	Walnut	Khey Shing	Juglandaceae	Tree	Fruits & trunk	Fruits are used during rituals, and the trunk is used for making altars.
Juniperus recurva Buch.-Ham. ex D.Don	Juniper	Shoogpo shing	Cupressaceae	Tree	Leaves & trunk	Burnt as incense to purify their worship place and surrounding. It is used as one of the ingredients for making incense by the manufacturer.
Magnolia champaca (L.) Baill. ex Pierre.	Champak	Champa Shing	Magnoliaceae	Tree	Trunk	Used for making altar.
Oroxylum indicum (L.) Kurz	Midnight horror	Namkaling	Bignoniaceae	Tree	Seeds	Used as an offering in rituals.
Oryza sativa L.	Paddy	Bara	Poaceae	Herb	Seeds	Used during rituals to drive away from the evil spirit.
Pinus bhutanica Grierson, D.G.Long & C.N.Page.	Bhutan Pine	Chang Shing	Pinaceae	Tree	Leaves & trunk	Fresh leaves are burnt for smoke offering, while the trunk is used as a prayer flag pole.
Pinus roxburghii Sarg.	Chir Pine	Roinang Shing	Pinaceae	Tree	Leaves & trunk	Fresh leaves are used for smoke offerings, while the trunk is used as a prayer flag pole.
Rhododendron ciliatum Hook.f.	Rhododendron	Baloo	Ericaceae	Shrub	Trunk & Leaves	Burnt as incense during religious rituals. They burnt it every morning and moved around their houses carrying the fragrant fumes to purify the surroundings. It is an important ingredient in manufacturing incense.
Rhododendron setosum D.Don	Rhododendron	Sooloo	Ericaceae	Shrub	Trunk & Leaves	Burnt as incense during religious rituals. They burnt it every morning and moved around their houses carrying the fragrant fumes to purify the surroundings. It is an important ingredient in manufacturing incense.
Rhus chinensis Mill.	Chinese sumac	Robtang shing	Anacardiaceae	Tree	Trunk	Used for making phallus (*Kharam shing*) to protect them from evil spirits and malicious talks (*Kharam*).
Rubia manjith Roxb.	Manjith	Lani ru	Rubiaceae	Climbers	Whole plant	Used during rituals and also used as a coloring agent.
Tectona grandis L.f.	Teak	Teak Shing	Lamiaceae	Tree	Trunk	Used for making alter due to good quality of wood.
Toona ciliata M.Roem.	Red Cedar	Rawa Shing	Meliaceae	Tree	Trunk	Used for making a mask for the mask dance.
Triticum aestivum L.	Bread Wheat	Bong	Poaceae	Herb	Seeds	Used during ritual to drive away evil spirits and flour from the grains are used for making the ritual cake.
Zea mays L.	Maize or corn	Ashom	Poaceae	Herb	Seeds	Used during ritual to drive away evil spirits and flour from the grains are used for making the ritual cake.

Artemisia vulgaris L.

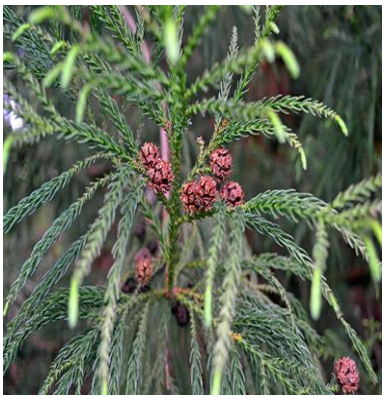
Bambusa vulgaris Schrad. ex J.C.Wendl.

Bombax ceiba L.

Brassica campestris L.



Cupressus corneyana Knight & Perry ex Carrière



Cryptomeria japonica (Thunb. ex L.f.) D.Don

Equisetum arvense L.

Erythrina arborescens Roxb.

Gaultheria fragrantissima Wall.

Juglans regia L.

Juniperus recurva Buch.-Ham. ex D.Don

Magnolia champaca (L.) Baill. ex Pierre.

Oroxylum indicum (L.) Kurz

Oryza sativa L.

Pinus bhutanica Grierson, D.G.Long & C.N.Page.

Pinus roxburghii Sarg.

Rhododendron ciliatum Hook.f.

Rhododendron setosum D.Don

Rhus chinensis Mill.

Rubia manjith Roxb.

Tectona grandis L.f.

Toona ciliata M.Roem.

Triticum aestivum L.

Zea mays L.

Figure 6. Some plant species from the study area

In conclusion, the study on socio-religious plants utilized by the people of Kanglung gewog found that plant resources are crucial for food, shelter, and medicine and for completing any socio-cultural or religious ceremonies. Furthermore, given the global context of climate change and increasing depletion of biological diversity due to modernity, different uses of plant resources in socio-cultural or socio-religious activities can be a significant step toward their protection and conservation of the environment. The current study demonstrates that the Kanglung community is rich in sacred plants and has an extensive understanding of plant religious beliefs, demonstrating the symbiotic relationship between humans and nature. However, indigenous cultures' age-old traditional practices, wisdom, and religious conceptions of indigenous cultures, on the other hand, are dwindling. The depletion of indigenous knowledge among the people of this community was severe owing to the disinterest of the young generation as a result of modern education, urbanization, and modernization. Therefore, this material will be extremely useful to current and future generations in preserving our indigenous knowledge and customs, and it will be beneficial in preserving cultural heritage.

ACKNOWLEDGEMENTS

Special thanks to all participants in Kanglung Gewog, Bhutan for actively participating in the survey.

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