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**Ethnobotany Study of Medicinal plants used by Mon People in Mon State
of Myanmar**



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Ethnobotany Study of Medicinal plants used by Mon People in Mon State of Myanmar

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Abstract

Medicinal plant knowledge of Myanmar's Mon people, who largely depend on traditional medical system for health care, is rarely studied. Ethnobotanical surveys and interviews were carried out in 10 villages of four townships in Mon State. Data was collected from interviews with 131 informants chosen via the snowball sampling method. Therapeutic uses of medicinal plants were categorized into ICPC-2 standard. Quantitative indices for evaluating the consensus of knowledge including Use Reports (URs), and Fidelity Level (FL) were computed using the ethnobotanyR package. In total, 158 medicinal plant species belonging to 137 genera and 64 families used by Mon people were recorded. Thirteen species were newly recorded as medicinal plants in Myanmar compared with previous studies. These medicinal plants were applied to 78 therapeutic uses classified into 16 ICPC-2 disease categories, with digestive (251 URs), urological (156 URs) and respiratory diseases (135 URs) ranking as the most prevalent diseases based on user reports. Fabaceae was the most represented family and leaf was the most commonly used plant part. Decoction and oral administration ranked top in preparation and administration methods respectively. *Tinospora sinensis* (Lour.) Merr (87 URs), the introduced species *Chromolaena odorata* (L.) R. M. King & H. Rob. (79 URs), *Mimosa pudica* L. (55 URs), *Tadehagi triquetrum* (L.) H. Ohashi (51 URs), *Alysicarpus vaginalis* (L.) DC (43 URs) were five most cited medicinal plant species for treating dysuria (71.74%), cuts and wounds (53.33%), cough (52.17%), diabetes (46%) and gall stone (31.53%) with high fidelity level (FL), respectively. The Mon people of Myanmar have a rich and diverse knowledge of traditional medicinal plants. The list of medicinal plants in Myanmar can be renewed with 13 more species added. This is the first quantitative ethnobotanical study into the medicinal plants and traditional knowledge of the Mon people.

Keywords: Myanmar, Mon people, medicinal plant, ethnobotany, quantitative

မွန်ပြည်နယ်ရှိ မွန်လူမျိုးတို့ အသုံးပြုသော ဆေးဖက်ဝင်အပင်များအား လူမှုရုက္ခဗေဒဆိုင်ရာ ရှုထောင့်မှ လေ့လာခြင်း

ယွန်းမီမီကျော်၊ သုတေသနလက်ထောက်-၂
သစ်တောသုတေသနဌာန၊ သစ်တောဦးစီးဌာန

စာတမ်းအကျဉ်း

ကျန်းမာရေး စောင့်ရှောက်မှုအတွက် ရိုးရာကျန်းမာရေး စောင့်ရှောက်မှုအပေါ်များစွာ မှီခိုနေသောမွန်လူမျိုးတို့အသုံးပြုသော ဆေးဖက်ဝင်အပင်များကို လေ့လာခဲ့ပါသည်။ ကွင်းဆင်း လေ့လာခြင်းနှင့် စစ်တမ်းကောက်ယူခြင်းကို မွန်ပြည်နယ်ရှိ မြို့နယ်(၄)မြို့နယ် အတွင်းရွာ(၁၀) ရွာတွင် လေ့လာခဲ့ပါသည်။ Snowball sampling method ကိုအသုံးပြု၍ ဒေသခံမွန်လူမျိုးများ (၁၃၁)ယောက်ထံမှ သတင်းအချက်အလက်များကို စစ်တမ်းကောက်ယူခြင်း ဆောင်ရွက်ခဲ့ပါ သည်။ဆေးဖက်ဝင်အပင်များတွင် အသုံးပြုသောရောဂါများကို ICPC-2 standardကို အခြေခံ၍ ရောဂါများကိုခွဲခြားခဲ့ပါသည်။ဒေသခံမွန်လူမျိုးများ၏ဗဟုသုတများကိုအခြေခံ၍ Ethnobotany R package ကို အသုံးပြုပြီး Use Reports (URs), and Fidelity Level (FL) ကို တွက်ချက် ခဲ့ပါသည်။ မွန်လူမျိုးများ အသုံးပြုသော ဆေးဖက်ဝင် အပင်မျိုးရင်း(၆၄)မျိုး၊ မျိုးစု (၁၃၇)မျိုး၊ မျိုးစိတ်(၁၅၈)မျိုးကို စုဆောင်းရရှိခဲ့ပါသည်။ ထိုဆေးဖက်ဝင်အပင်များထဲတွင် မြန်မာနိုင်ငံမှ ထွက်ရှိပြီးသော နိုင်ငံတကာဂျာနယ်တွင် လေ့လာပြီးသော ဆေးဖက်ဝင်အပင်များနှင့် နှိုင်းယှဉ် ရာမှမျိုးစိတ်(၁၃)မျိုးကို စုဆောင်းတွေ့ရှိခဲ့ရပါသည်။ ဆေးဖက်ဝင်အပင်များတွင် အသုံးပြုသော ရောဂါ(၇၈) မျိုးကို ICPC-2 အရ ရောဂါ အမျိုးအစား (၁၆) မျိုးခွဲခြား ထားပါ သည်။ ထိုရောဂါ အမျိုးအစား(၁၆)မျိုးမှအစာခြေစနစ်နှင့်ဆက်စပ်သောရောဂါ(၂၅၁)URS,ဆီးရောဂါနှင့် ဆက်စပ် သောရောဂါ(၁၅၆)URS, အသက်ရှူလမ်းကြောင်းနှင့် ဆက်စပ်သောရောဂါ(၁၃၅)URSများသည် အမှတ်စဉ်စီရာတွင် ထိပ်ဆုံးက ပါဝင်ပါသည်။ Fabaceae မျိုးရင်း သည် အများဆုံး ကိုယ်စားပြု မျိုးရင်းဖြစ်ပြီး အရွက်သည် အများဆုံး အသုံး ပြုသော အစိတ် အပိုင်း ဖြစ်ပါသည်။ *Tinospora sinensis* (Lour.) Merr (၈၇ URs)ကို fidelity level(FL)အရ ဆီးချိုရောဂါ ကုသရာတွင် (၄၆%), *Chromolaena odorata* (L.) R. M. King & H. Rob.(၇၉ URs) ကို fidelity level (FL) အရ ထိခိုက်ဒဏ်ရာ ကုသရာတွင် (၅၃.၃၃%), *Mimosa pudica* L. (၅၅ URs) ကို fidelity level (FL) အရ ဆီးကြောပိတ်ခြင်း ကုသရာတွင် (၇၁.၇၄%), *Tadehagi triquetrum* (L.) H. Ohashi (၅၁ URs)ကိုfidelity level(FL)အရ ချောင်းဆိုးခြင်းကုသရာတွင်(၅၂.၁၇%), *Alysicarpus vaginalis* (L.)DC(၄၃ URs)ကို fidelity level(FL)အရ ကျောက်တည်ခြင်းကုသရာတွင် (၃၁.၅၃%) ကုသ

ခြင်းများတွင် အသုံးပြုကြပါသည်။ မွန်လူမျိုး များသည် ဆေးဖက်ဝင် အပင်များနှင့် ပတ်သက်၍ ဗဟုသုတများစွာရှိကြပါသည်။ ဆေးဖက်ဝင်အပင်များ စာရင်းတွင်လည်း မျိုးစိတ် (၁၃)မျိုးကို ဖြည့်စွက်နိုင်ပါသည်။ ဤသုတေသနသည် မွန်လူမျိုး တို့၏ ပထမဆုံးသော ရိုးရာ ဗဟုသုတကို အခြေခံ၍ လူမှုရုက္ခဗေဒဆိုင်ရာ လေ့လာမှု တစ်ခုဖြစ်ကြောင်း တင်ပြအပ်ပါသည်။

Ethnobotany Study of Medicinal plants used by Mon People in Mon State of Myanmar

1. Introduction

1.1 Medicinal plants for health care

Medicinal plants have long been an important component of health care systems. Records of plants used as medicine date back to the Middle Paleolithic age 60,000 years ago (Solecki, 1975). Plants still serve as a source of modern drug development and as a major solution to ailment treatment. More than half of the novel drugs originate from natural products of plants and plant derivatives (Chin et al., 2006). As reported by the WHO, 70-95% of population in developing countries rely on traditional medicine as major tool for health care. In developed countries people also seek “complementary” or “alternative” therapies from plants (Robinson & Zhang, 2011).

1.2 Traditional knowledge on medicinal plants

Traditional medicinal plant knowledge has been applied for generations by various cultures. The uses provide basic clues and served as an efficient method in the process of bioactive screening and exploring modern drugs. The herbal medicines are widely used in traditional medicinal system such as the traditional Chinese medicine (TCM) in China, Ayurveda medicine in India, Siddha medicine in Tamil Nadu, Unani medicine in India, Kampo medicine in Japan, traditional Korean medicine (TKM) in Korea, Traditional Thai medicine in Thailand, traditional Cambodian medicine in Cambodia, Iranian traditional medicine (ITM) in Iran, Jamu medicine in Indonesia, traditional Mongolian medicine in Mongolia, traditional Tibetan medicine in Tibet, traditional Vietnamese medicine in Vietnam (Grayson, 2011). The most frequently used 122 chemical compounds in the world as drugs were discovered from 94 plant species and the medical function of 80% of these chemicals are in line with their traditional medical applications (Fabricant & Farnsworth, 2001). The most well-known drugs, including artemisinin (Efferth, 2017) and quinine (Renslo, 2013) are rooted from traditional knowledge.

1.3 Biological and cultural diversity of Myanmar

Myanmar is the second largest country in Southeast Asia, with a total land of 676,578 km² and a population of 55.62 million (CIA, 2019). It is situated in Indo-Burma biodiversity hotspot (Mittermeier et al., 2011) and known for its rich biodiversity and culture diversity. There are 11,800 gymnosperm and angiosperm species (Kress et al., 2003), and 300 mammal species, 1096 bird species, 291 reptile species, 119 amphibian species, 1197 butterfly species and 520 freshwater fish species (Forest Department, 2015) reported in Myanmar. Myanmar comprises eight major ethnic groups with further division of 135 sub-groups (CIA, 2019). The major ethnic groups include Kachin, Kayah, Kayin, Chin, Mon, Bamar, Rakhine and Shan. The rich biodiversity and culture diversity made Myanmar an important place to explore the relationship between people and plant, such as medicinal use of plant species.

1.4 Myanmar's traditional medical system

In Myanmar, the majority of the populations had been relying on traditional herbal remedy for the treatment of various diseases for generations. The traditional medical system was peak at the periods of Tagaung, Srikitra, and Bagan (Ministry of Health and Sports, 2019). Earlier Myanmar medical knowledge was recorded on palm leaves. Myanmar traditional medicine is based on Ayurvedic concepts and influenced by Buddhist philosophy. Ayurveda was introduced to Burma in approximately 700 AD (WHO, 2001). Four main branches of traditional medicine are (1) The Desana system-based on Buddha's philosophy and natural phenomena such as hot and cold with the therapeutics use of herbal and mineral compounds and diet, (2) The Bethizza system- based on Ayurvedic concepts, (3) The Astrological system or Netkhata vada- based on the calculations of zodiac of stars, planets and the time of birth and age, (4) The Vezzadara system- based on meditation and practices of alchemy (WHO, 2004). Myanmar traditional medicinal plant encyclopedia (Shinnagathein, 1968, 1969, 1971, 1973) written by Buddhist monk is still famous among the Myanmar people. Nowadays, traditional medicine is administrated by the Department of Traditional Medicine, Ministry of Health and Sports with aim to strengthen the provision of traditional medicine services to the people. University of Traditional Medicine, Mandalay (UTM), opened on 19th December 2001 serves as the major provider of formal service on disseminating the traditional medical knowledge over the country. Myanmar Traditional Medicine Council and Myanmar Traditional Medicine Practitioners Association were also devised to facilitate the development of traditional medical system.

1.5 Health care system of Myanmar

Myanmar's health care is of global concern, especially on its low health care expenditure, insufficient health service, and high prevalence of HIV/AIDS, malaria and tuberculosis (Han et al., 2018; Mu et al., 2016; Zaw et al., 2015). Since 2011 Myanmar has experienced fast economic growth, yet economic development is still low, with a GDP per capita of US\$ 1,325.95 in 2018, in contrasting to the global average GDP per capital of US\$ 11,317.27 (The World Bank Group, 2020). In equivalent to its low GDP value, the health expenditure as share of GDP in Myanmar is only 4.9% in 2017, lower than the global mean of 7% (WHO, 2020). In addition, only one health insurance scheme, namely the Social Security Services (SSS) covering 3.2% of the total 21.8 million employees (Myint et al., 2019), is available in Myanmar, which made the out-of-pocket financing accounting for the 81% total health expenditure, almost the highest in the world (Zaw et al., 2015). Moreover, information and data on the health care status is general absent to international audience. Based on the data of 2014 (Latt et al., 2016), amongst 3,514 public health facilities of all kinds (including Curative and rehabilitative services, preventive and public health services and traditional medicines) and 31,542 medical doctors, there are 16 public traditional hospitals and 243 traditional medicinal clinics with 1,048 traditional medical practitioners, and another 5,915 private traditional medicinal practitioners, which forms the key resources supporting the Myanmar's health care. This indicates that traditional medicine is a hard to neglect factor contributing the health service of Myanmar people in the past and to the future.

1.7 Recent ethnobotanical and ethnopharmacological studies on medicinal plants of Myanmar

In recent decades, Myanmar opened the door to international scientific exploration, which promoted scientific research on medicinal plants. Ethnobotany and ethnopharmacology researches are surging in recent two decades (Tun et al., 2019). Japanese researchers (Fujikawa et al., 2007; Fujikawa et al., 2009) started ethnobotanical surveys since the year 2000. They documented 181 herbal medicines from local markets of Myanmar. After that, publications on ethnobotanical researches on medicinal plants in Myanmar were only renewed in recent few years. Researchers from Japan, South Korea and China published several works on plants used in certain areas or ethnic groups in Myanmar. Ong et al., (Ong et al., 2018a) documented the wild medicinal plants used in traditional herbal therapies among the Müün ethnic group in southern Chin State and compared the differences of using medicinal plants between the ethnic groups of Müün, Ng'gah and Daai in Natma Taung National Park (Ong et al., 2018b). Research conducted in South Shan State documented 18 medicinal plant species (Shin et al., 2018). The Medicinal Plant List of Myanmar, the first comprehensive book published by FAME Company, the most famous drug company in Myanmar, compiled a list of 1540 species used in Myanmar (Lwin & Lwin, 2015). However, except the names (Myanmar name, Botanical Name and Common name), other information in this book is lacking. Recently, DeFilipps & Krupnick, (2018) summarized the medicinal plants used in Myanmar based on monographs, books, and pamphlets translated from Burmese to English, showing a total number of 472 plant species from 123 families used as medicine. These publications provide pilot investigations and fundamental information on understanding the value of the wealthy biodiversity and culture of medicinal plants in Myanmar.

Researches on bioactivity guided phytochemical and pharmaceutical researcher for the medicinal plants traditionally used in Myanmar also increased. For instance, 118 medicinal plants were screened to search for novel anti-influenza drugs (Shoji et al., 2017); 71 plant materials from 60 plant species were studied for antitrypanosomal activity against trypomastigotes of *Trypanosoma evansi* and cytotoxicity against MRC-5 cells in vitro (Bawm et al., 2010); and 93 traditional Myanmar medicinal plants were tested for their inhibition to bacteria and as inhibitors for the T3SS (Li et al., 2018). Species were intensively investigated for their bioactive chemical compounds including *Boesenbergia rotunda* (L.) Mansf. (Win et al., 2007), *Kaempferia pulchra* (Win et al., 2016b), *Kayea assamica* (Win et al., 2008a, b), *Picrasma javanica* (Win et al., 2016a; Win et al., 2016c), *Curcuma amada* (Win et al., 2017), *Premna integrifolia* (Win et al., 2018), *Jatropha multifida* (Shoji et al., 2017), and *Soyimida febrifuga* (Suresh et al., 2009).

1.6 Brief introduction of Mon people

Mon people were said as the first dweller of mainland of Southeast Asia who have settled down in the territory of current Myanmar at least 1,000 B.C. ago (Mon, 2010). They are most probably the descendant of the immigrants from Southern China around 2,000 B.C or earlier (Hla, 1992). The Mons were known as (Rmen) (ရမေဉ်) in Pagan Era and change the (Rman) (ရမန်) in Hanthawaddy Era and Nowadays, were known as (Mon) (မွန်) (Enriquez, 1933). The early Mon kingdoms in Burma were Suwunnabhumi (also known as Thaton), and the Mon capital of northern Thailand is Lalpang (Mon, 2010). Mon people were also the first

believer and transmitter of Theravada Buddhism in the region. Mon people dominated and/or ruled southern Myanmar and Thailand, which peaked at the period of Dvaraviti during the period of 6th-11th centuries. They made strong influence on the language and culture of nowadays' Thai and Burmese. Since A.D. 1024 when Khmer empire invaded, Mon people gradually lost their political power and became marginal groups. Till now, the total population of Mon people is around 1.2 million with 1.1 million dwelling in Mon State comprising 2% of total population of Myanmar (CIA, 2019), with the rest of 10,000 settled in Thailand. Now, about 99 % of Mon people are Buddhists and small percentages are Christian (South, 2013). However, despite their important role on shaping the history of Southeast Asia, not much reference is available on their traditional medical system.

1.7 Research gap and significance of the study

As the result of political unease and slow social economic development, the valuable knowledge and resources on medicinal plants of Mon people remains unknown at the international scale. The general status of the biodiversity of medicinal plants used by Mon people and their usages, threats and sustainable issues are still under questioning that require intensive research efforts. To our knowledge, this is the first ethnobotanical study on the Mon traditional medicine in Myanmar. It helps on the preservation of local knowledge, the promotion of indigenous medical systems in primary health care, and the conservation of biodiversity of the indigenous people of Mon.

2. Objectives

In this study, we aimed at:

- (1) To document the diversity of Mon traditional medicinal plants and their therapeutic usages;
- (2) To quantitatively identify the most well-known Mon traditional medicinal plants and prevalent diseases treated by these species and to evaluate their status of research and application.

2.1 Research questions

1) what species are used as MTMs and what diseases can be treated with these MTMs? 2) what are the general characteristics of the MTMs? 3) which species and their usages have high consensus of knowledge?

3. Materials and Methods

3.1 Study area

Mon State locates in the south part of Myanmar with Mawlamyine as the capital city. Geographically, Mon State is situated between the latitudes of 14°52' N and 17°32'N and the longitudes of 96°51'E and 98°13'E with a mean elevation of 85m ranging between sea level

to 1,153m¹. It covers a total land area of 12,297km². Situated in low latitude and along Andaman Sea, Mon State is featured with tropical climate. The monthly mean temperature ranges from 18°C in January to 36°C in April; and the annual precipitation is high that can reach up to 4,709 mm (Fick & Hijmans, 2017).

The population in Mon State is around 2 million (Department of Population, 2014), with Mon people as the main ethnic group, in together with Burmese and a small number of Kayin and Pa-O ethnic groups. Majority of the population are Buddhist. In Mon State, agriculture is the biggest source of income, especially from rice and rubber. Others include betel and cashew nuts in hilly areas, and fishing, fish products (dry fish, fish sauce) and agar-agar at coastal areas. The public health facilities and number of health servants are less equipped comparing to the already low national average. Only 61% villages are facilitated with medical facilities of all sorts (Hein et al., 2016). The rate of sanctioned health workers is only 0.33‰ in Mon State, lower than the national rate of 0.68‰ and far more below global standard of 2.28‰ (Mandakh, 2017).

3.2 Data collection on traditional knowledge

An ethnobotanical field survey was conducted during from the start of October to the end of November 2018 at 10 villages in four Townships (Kyaikmaraw, Thanbyuzayat, Mudon, Paung, **Figure 1**, **Table 1**), chosen to represent the typical biological and cultural environment of Mon State. A total of 131 Mon informants (**Table 2**), 89 males and 42 females, aged between 28-85, were interviewed. The informants were selected based on snowball sampling method. Before the survey, the objectives of the study were explained and permission was required from the village leader. As an official process, the surveys and interviews were then conducted under the assistance of officers from Forest Department of Myanmar (MONREC, Ministry of Natural Resources and Environmental Conservation). Informants were identified and semi-structure interviews were conducted with informed consent. The interviews followed the International code of ethics defined by the International Society of Ethnobiology in 2006 (ISE, 2006). Demographic information of the informants (age, gender, ethnic group, education level and occupation) was recorded together with the information of medicinal plants (vernacular name, use part, diseases, preparation and administration methods, source of knowledge). Interviews were carried out either in Burmese or Mon language with support of local assistant, and were then translated into English during the final data entry to Excel.

¹ data retrieved from <http://diva-gis.org/gdata> using `geData()` of Raster package under R language.

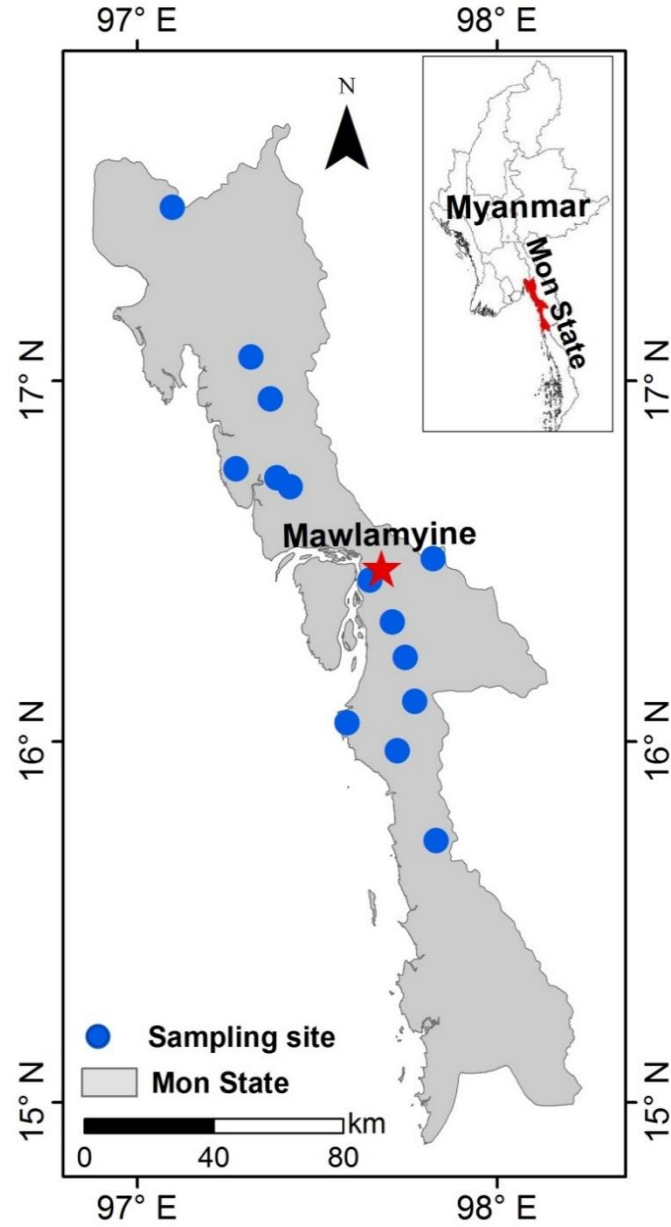


Figure 1 Map of the study area and sampling sites

Table 1. Basic information of the surveyed villages

Township	Village	GPS point	Elevation
Kyeikmaraw	Dhamma Tha	16°30'29.1492" N 97°49'19.542" E	10 m
Thanbyuzayat	Aung Chan Thar	15°58'31.926" N 97°43'24.708" E	11 m
	Wea Kha Mi	15°43'36.5124" N 97°49'51.852" E	25 m
	Mya Mar Lar	15°3'7.794" N 97°35'0.4308" E	81 m
Mudon	Nyaung Kone	16°14' 0.2652" N	12 m

	Ka Lawt Thawt	97°27'9.468" E	66 m
		16°6'44.7048" N	
	Kyauk Ta Lone	97°46'16.5396" E	21 m
		16°19'55.8156" N	
Paung	Htan Pin Chaung	97°42'35.2692" E	8 m
		16°45'24.2388" N	
	Lay	92°16'32.6244" E	5 m
	Ka Tun	16°43'53.8356" N	
	Zin Kyaik	97°23'20.9148" E	31 m
		16°42'22.2876" N	
		97°25'34.0572" E	

Table 2. Demographic information of informants

Basic data of informants	Number of informants	% of total informant
Gender		
Male (M)	89	67.94%
Female (F)	42	32.06%
Age		
28-47 (Young)	27	20.61%
48-67 (Middle)	83	63.36%
68-85 (Old)	21	16.03%
Education level		
High	14	10.69%
Middle	30	22.90%
Basic	69	52.67%
Monastery education	16	12.21%
Non-education	2	1.53%
Occupation		
Farmer	100	76.34%
Local healer	10	7.63%
Dependent	12	9.16%
Government Staff	6	4.58%
Shopkeeper	1	0.76%
Monk	2	1.53%

3.3 Specimen collection and identification

Specimens were collected either from wild or home gardens under the guidance of informants. We collected three replicates of voucher specimens and their DNA samples. One replicate was deposited at RAF (Herbarium of Forest Research Institute, Forest Department of Myanmar), and two were deposited at KUN (Herbarium of Kunming Institute of Botany, Chinese Academy of Sciences). Identification was done by experts from Kunming Institute of Botany, Chinese Academy of Sciences (Mrs. Yang Jun), Kunming Institute of Survey and

Design, State Forestry and Grassland Administration (Dr. Mingxu Zhao and Mr. Jinchao Yang), and New York Botanical Garden (Dr. Kate Armstrong) with referencing the *A Checklist of Myanmar* (Kress et al., 2003). The scientific names were cross-checked with the data of Plants of the World Online (<http://plantsoftheworldonline.org>) (POWO, 2020). The key information of each species was recorded, and is given in (**Appendix**) with APG IV order.

3.4 Disease category classification

Therapeutic usages of surveyed medicinal plants were recorded using local terms in Burmese language, with which members of the field survey were familiar, and were translated into English and supplemented with their Mon names. They were finally converted into disease categories following the International Classification of Primary Care (ICPC-2, <http://www.who.int/classification/icd/adaptations/icpc2/en/>) (Soler et al., 2008; Staub et al., 2015). The conversion from the original record of therapeutic usage to ICPC-2 categories was the result of a group discussion among the research team to avoid personal bias. Confirmation of the local terms and translations were acquired by Medical Anthropologist at Mawlamyine Hospital.

3.5 Quantitative ethnobotanical data analysis

We applied Use Reports (URs) to evaluate the knowledge consensus of medicinal plants and prevalent diseases, and to prioritize the most cited species by Mon people. Fidelity Level (FL) was applied to evaluate consensus on the specific therapeutic usage among different people of a given species. These quantitative indices were calculated using ethnobotanyR package (Whitney, 2020) in the R programming language (R Core Team, 2020).

3.5.1 URs

The Use Reports (URs) is the simplest and direct descriptive statistic for the evaluation of the knowledge consensus of using species for various usages. A URs is counted when one informant mentions a species for a specific usage (Kufer et al., 2005). If one informant mentions two usages of a given species, two URs are counted; and if two informants mention the same usage of the given species, two URs are counted. In this study, URs are summed up for a given species, and a given disease. Based on the URs, we ranked the top cited medicinal plants and the most prevalent diseases.

3.5.2 FL

The Fidelity Level (FL) developed by Friedman et al., (Friedman et al., 1986) is the ratio between the number of informants who mentioned the use of specific plant for a particular purpose and the total number of informants who mentioned the use of the same plant for any purpose (equation 1). It measures the level of agreement among informants on using specific species for specific usage. High FL value suggests that large proportion of informants know the specific plant species for the specific usage. Low FL indicates small proportion of the informants know the specific plant species for the specific usage. However, FL will be inflated when few informants mention few diseases for a given species, in extreme cases of one informant mentioning one disease to be treated by a given species the FL value is 100.

This will be problematic when one conducts inter species comparison. Otherwise, FL is useful on intra species evaluating over the knowledge consensus. With consideration of this limitation, we applied FL on evaluating the consensus of various diseases using the same given species, with focus on the top five cited species.

$$FL\% = \frac{I_p}{I_u} * 100 \quad (1)$$

where I_p is the number of informants who independently suggested the use of the specific plant for a particular purpose, and I_u is the total number of informants who mentioned that plant for any use or purpose.

4. Results

4.1 Diversity and characteristics of Mon traditional medicinal plants

In total, 158 plant taxa belonging to 137 genera and 64 families (**Appendix**) were recorded and identified with Myanmar vernacular names and an additional 28 taxa remained un-identified and therefore were not included in the final analysis. The most cited families were Fabaceae (17 species, 10.76%), Lamiaceae (9 species, 5.7%), Apocynaceae (8 species, 5.06%), Asteraceae (8 species, 5.06%), and Euphorbiaceae (8 species, 5.06%) (**Figure 3**).

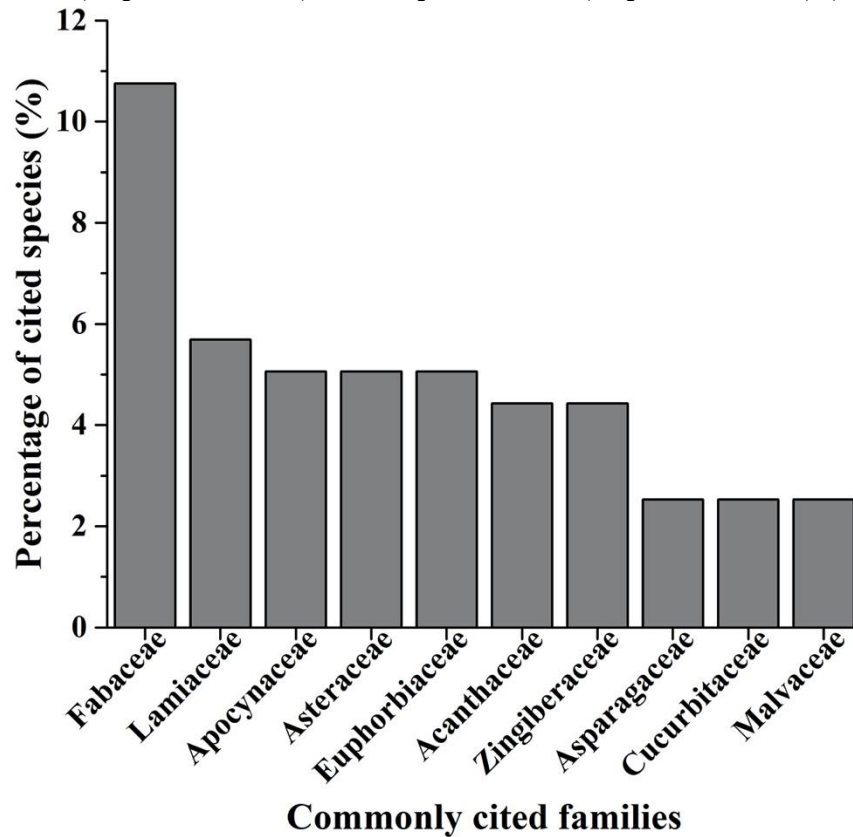


Figure 3. Commonly cited families and their percentage of cited species by the informants

Most of the documented species are herbs (56 species, 35.44%) followed by trees (45 species, 28.48%), shrubs (34 species, 21.52%) and vines (23 species, 14.56%) (**Figure 4**).

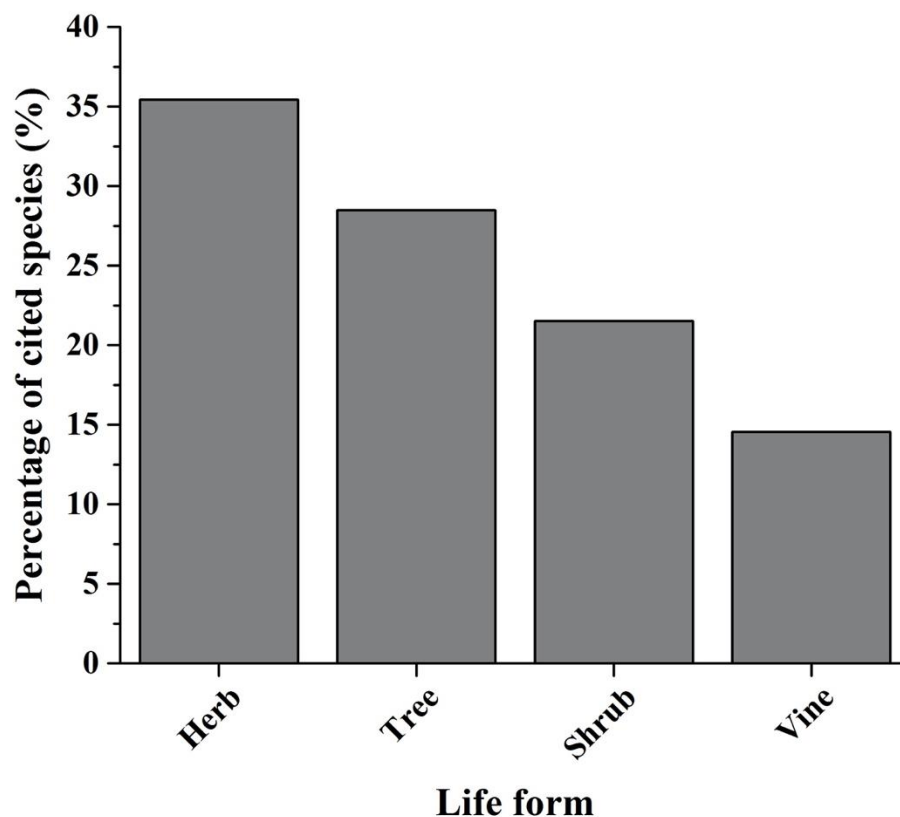


Figure 4. Life form and their percentage of cited species by the informants

Leaves represent the most used plant part (77 species, 48.73%), followed by the whole plant (50 species, 31.65%), root (32 species, 20.25%), fruit (21 species, 13.29%), bark (16 species, 10.13%) *etc* (**Figure 5**).

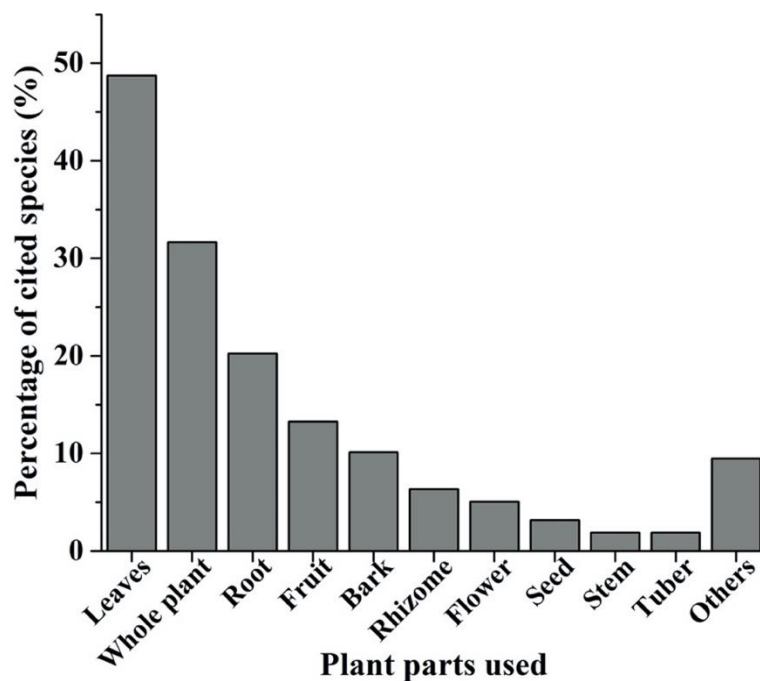


Figure 5. Plant parts used for disease treatment and their percentage of cited species by the informants

Ten methods of preparation were documented. The majority of the plants are prepared as a decoction (100 species, 63.29%), juice (58 species, 36.71%), food (55 species, 34.81%), instant teas (38 species, 24.05%), powder (30 species, 18.99%), as shown in **(Figure 6)**. Seven different modes of administration were documented. Oral administration ranks top (126 species, 79.75%), followed by topical, bathing, nasal, eye-drop, mouthwash and ear-drop **(Figure 7)**.

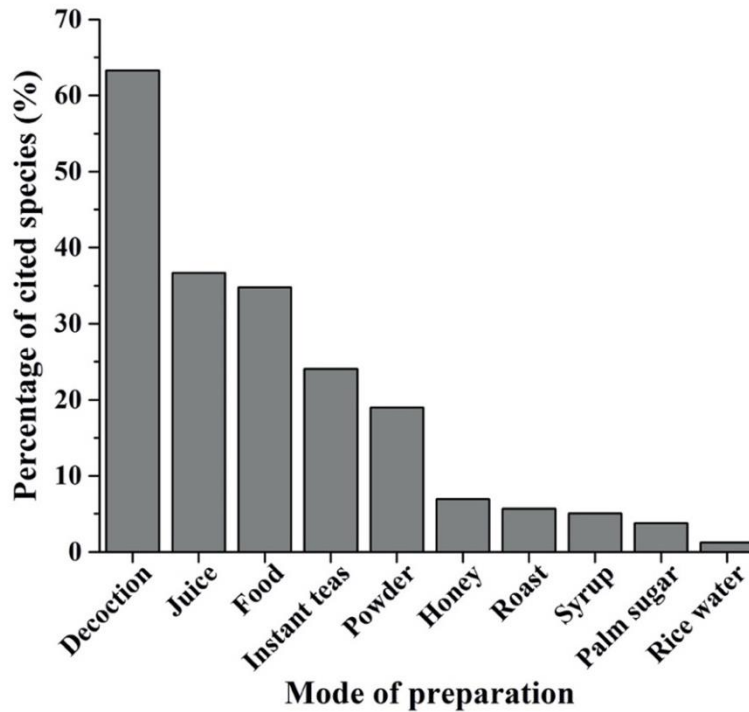


Figure 6. Mode of preparation for disease treatment and their percentage of cited species by the informants

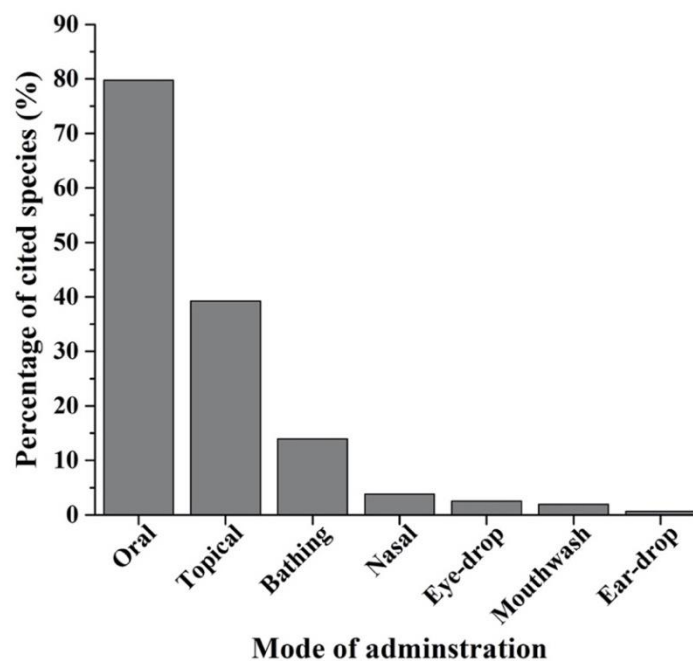


Figure 7. Mode of administration and their percentage of cited species by the informants

4.2 Diseases treated by Mon traditional medicinal plants and consensus of knowledge

The 1187 URs described a total of 78 therapeutic usages for the 158 medicinal plants mentioned above. The usages could be classified into 16 ICPC-2 disease categories (**Table 3**). Digestive (251 URs), urological (156 URs), and respiratory (135 URs) disorders ranked as the most prevalent diseases, and our interviews provided much information on therapy of these diseases using medicinal plants (**Table 3**). Detailed information on the diseases treated by each species can be found in **Appendix**. The five most cited species based on URs were *Tinospora sinensis* (Lour.) Merr (87 URs), *Chromolaena odorata* (L.) R. M. King & H. Rob. (URs=79), *Mimosa pudica* L. (URs=55), *Tadehagi triquetrum* (L.) H. Ohashi (URs=51), and *Alysicarpus vaginalis* (L.) DC (URs=43) (**Appendix**) and (**Figure 8**) shows that five most cited species by Mon people in Mon State.

In terms of knowledge consensus on the medical uses, *M. pudica* had highest FL of 71.74% on treatment of dysuria (**Table 4**). Likewise, *C. odorata* had highest FL of 53.33% for treating cuts and wounds; *T. triquetrum* for cough with FL of 52.17%; *T. sinensis* for diabetes with FL of 46%; and *A. vaginalis* for gall stone with FL of 31.43% (**Table 4**).

Table 3. Number of URs to each ICPC-2 disease category

ICPC-2 Disease Category	No. of URs
Digestive	251
Urological	156
Respiratory	135
Endocrine/ Metabolic and Nutritional	132
Skin	113
General and Unspecified	82
Malaria	11
Tuberculosis	13
Cardiovascular	97
Musculoskeletal	54
Blood, Blood Forming Organs and Immune Mechanism	45
Eye	37
Neurological	29
Female Genital	16
Ear	14
Pregnancy, Childbearing, Family planning	2
Total	1187

Table 4. FL% of top cited medicinal plants used by Mon people for various therapeutic usages

Species name	Therapeutic usage	I _p	I _u	FL %
<i>Mimosa pudica</i>	Dysuria	33	46	71.74
	Urinary tract infection	6	46	13.04
	Jaundice	4	46	8.7
	Cough	4	46	8.7

	Cuts and wounds	4	46	8.7
	Edema	2	46	4.35
	Fever	1	46	2.17
	Ulcer	1	46	2.17
<i>Chromolaena odorata</i>	Cuts and wounds	32	60	53.33
	Cough	31	60	51.67
	Hepatitis B virus	3	60	5
	Blood cough	3	60	4.92
	Tuberculosis	2	60	3.3
	Fever	1	60	1.67
	Internal pain	1	60	1.67
	Longevity	1	60	1.67
	Cancer	1	60	1.67
	Internal organ cancer	1	60	1.67
	Liver disease	1	60	1.67
	Hypertension	1	60	1.67
	Herpes	1	60	1.67
<i>Tadehagi triquetrum</i>	Cough	24	46	52.17
	Dysuria	11	46	23.91
	Tuberculosis	7	46	15.22
	Asthma	3	46	6.52
	Hematemesis	1	46	2.17
	Hepatitis B virus	1	46	2.17
	Hepatitis C virus	1	46	2.17
	Weight loss	1	46	2.17
	Renal disease	1	46	2.17
	Urinary tract infection	1	46	2.17
<i>Tinospora sinensis</i>	Diabetes	23	50	46
	Hypertension	15	50	30
	Tonic	11	50	22
	Dyspepsia	9	50	18
	Flatulence	8	50	16
	Longevity	7	50	14
	Paralysis	4	50	8
	Bone fracture	2	50	4
	Joint ache	2	50	4
	Malaria	1	50	2
	Abdominal pain	1	50	2
	Liver disease	1	50	2
	Stomache	1	50	2
	Eye disease	1	50	2
	Cough	1	50	2
<i>Alysicarpus vaginalis</i>	Gall stone	11	35	31.43

Jaundice	10	35	28.57
Dysuria	10	35	28.57
Renal disease	5	35	14.29
Urinary tract infection	5	35	14.29
Asthma	1	35	2.86
Cough	1	35	2.86

Note: I_p Number of informants who mentioned the use of a particular ailments; I_u Total number of informants who mentioned the plant for any use

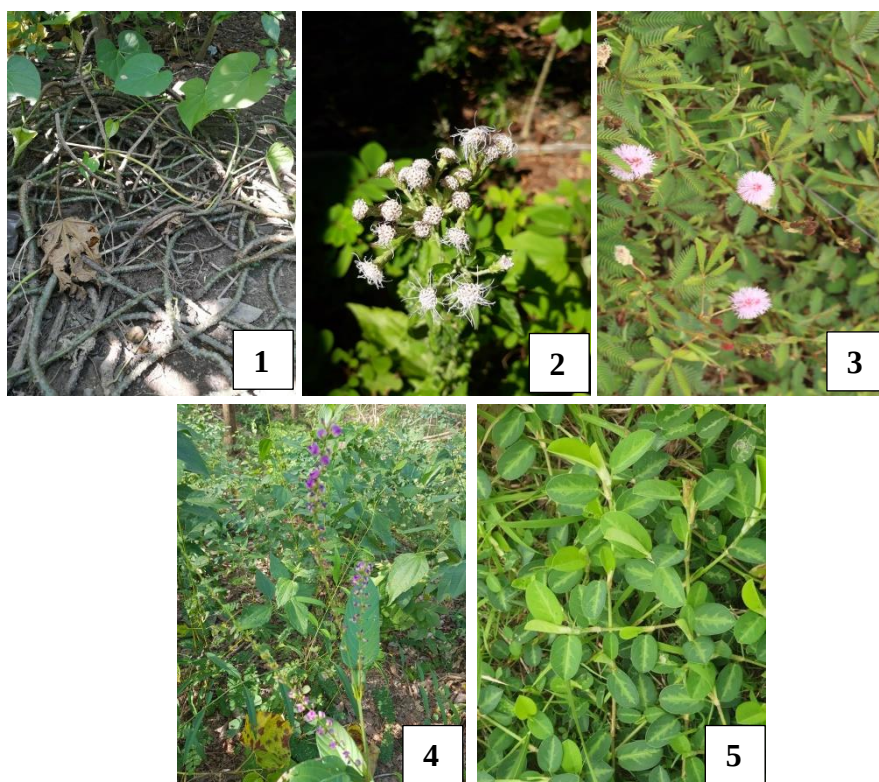


Figure 8. Five most cited species: (1) *Tinospora sinensis*, (2) *Chromolaena odorata*, (3) *Mimosa pudica*, (4) *Tadehagi triquetrum*, (5) *Alysicarpus vaginalis*

4.3 New record of medicinal plants and their applications

Comparing with previous medicinal plant lists published (DeFilipps & Krupnick, 2018; Khaing & Moe, 2019; Khine et al., 2007; Lwin & Lwin, 2015; Myint, 2017;), our work contributed another 13 species as medicinal plants used by Mon people (**Appendix**). They are (1) *Uvaria littoralis* (Blume) Blume (Annonaceae) showed consensus with 5 URs (**Appendix, SN 13**), “Thabut-mae thi” in Burmese language and is well-known medicinal plant in Mon State and collected in the home compound. In our study area, the informants reported that the root and fruit are used for constipation and dizziness. The leaf decoction and inhaling of the leaf is used for diarrhoea, dyspepsia. The leaf extract can be applied on the skin to cure for scar. (2) *Eryngium foetidum* L. (Apiaceae) (**Appendix, SN 15**), the local

informant called “Shan-nan-nan” in Myanmar, herb, is known for food and the leaves are treating for hypertension. (3) *Dieffenbachia seguine* (Jacq.) Schott, (Araceae) (**Appendix, SN 24**), “Na-hu-ya” in Burmese language and leaf extract is applied directly to the skin for the treatment of ulcer. (4) *Hydrocotyle verticillata* Thunb, (Araliaceae) (**Appendix, SN 26**), “Myin-khwa-gyi” in Burmese language, the decoction of rhizome, leave and whole plant are used for treating especially in eye diseases and other such as tonic, longevity, jaundice, diabetic, asthma and menstrual disorder. Moreover, the whole plant, rhizome and leaf can be consumed as food. (5) *Pluchea indica* (L.) Less. (Asteraceae) (**Appendix, SN 41**), is known as “Kha-lu” in Burmese language, shrub and found in tidal forest in Mon State. The leaves were eaten as food to treatment in constipation. (6) *Tradescantia zebrina* Bosse. (Commelinaceae) (**Appendix, SN 55**), herb, is commonly known as “Yae-war”, is found in home compound and the farm land in Mon State. The Mon people are used as leaf decoction in diabetic, edema, intrahepatic stone and gall stone. (7) *Plukenetia volubilis* L (Euphorbiaceae) (**Appendix, SN 72**) and cultivated in some home compound. The roasted seeds are used for eye disease, diabetic and heart disease. (8) *Derris trifoliata* Lour., (Fabaceae) (**Appendix, SN 78**), vine, “Mi-chaungnwe” in Burmese language according to the local reported the bark decoction uses to treat cancer. (9) *Phyllocyclus lucidissimus* (H.Lév. & Vaniot) Thiv (Gentianaceae) (**Appendix, SN 90**), locally known as “Taung-kya” and found in limestone mountain in Mon State. The whole plant of decoction uses to cure for renal disease. (10) *Eleutherine bulbosa* (Mill.) Urb. (Iridaceae) (**Appendix 2, SN 91**), herb, known as “Gamon-ni” in Burmese language and the powder of tuber uses for blood tonic. (11) *Lagerstroemia floribunda* Jack (Lythraceae) (**Appendix, SN 104**), tree, and “Pyin-ma-phyu” in Burmese language. The extract of the root uses for cancer treatment and applied directly to the skin to treat acne, herpes and bone fracture. (12) *Peperomia pellucida* (L.) Kunth (Piperaceae) (**Appendix, SN 130**), herb, Burmese name is “Kyauk-thin-pone”. The whole plant decoction uses to treat intrahepatic stone and urinary tract infection. (13) *Lippia alba* (Mill.) N.E.Br. ex Britton & P. Wilson (Verbenaceae), (**Appendix, SN 149**), herb, known for “Kalar-pinpsein” in Myanmar and the decoction of leaves are curing in fever. **Figure 9** shown the new record of medicinal plants

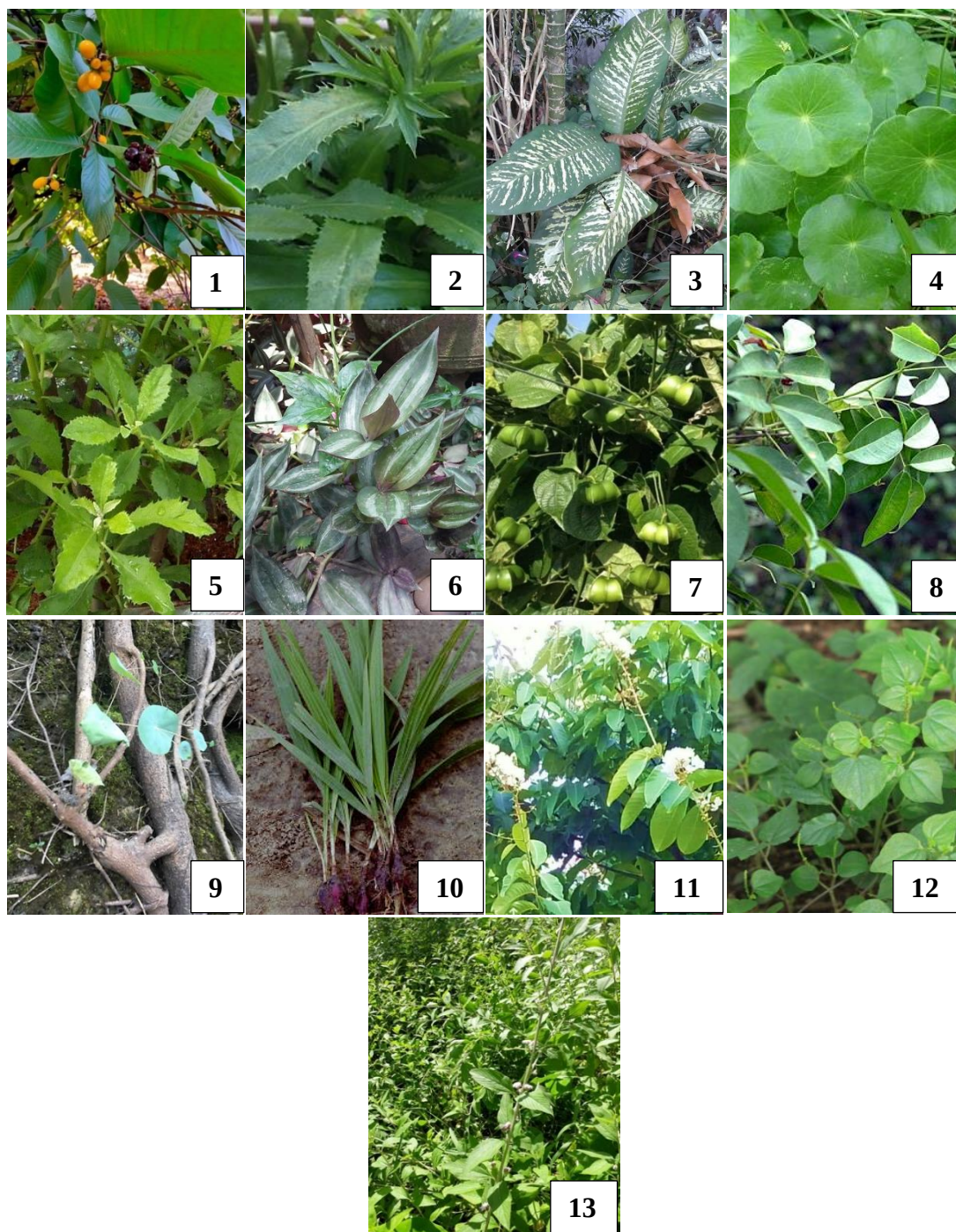


Figure 9. Thirteen new record of medicinal plants: (1) *Uvaria littoralis*, (2) *Eryngium foetidum*, (3) *Dieffenbachia seguine*, (4) *Hydrocotyle verticillata*, (5) *Pluchea indica*, (6) *Tradescantia zebrina*, (7) *Plukenetia volubilis*, (8) *Derris trifoliata*, (9) *Phyllocyclus lucidissimus*, (10) *Eleutherine bulbosa*, (11) *Lagerstroemia floribunda*, (12) *Peperomia pellucida*, (13) *Lippia alba*

5. Discussion

5.1 Diversity of medicinal plants and their utilization

We documented a rich diversity and knowledge of Mon People on using 158 plant species from 64 families to treat 78 ailments belonging to 16 ICPC-2 disease categories. The high representation of medicinal plants from families including Fabaceae, Asteraceae, Lamiaceae, Apocynaceae and Euphorbiaceae is a common phenomenon in the Indo-Burma region, which also reflects the dominance of these families in the region (Lee et al., 2019; Phumthum et al., 2018; Prabhu et al., 2014; Verma, 2014).

A big proportion of the medicinal plants used by Mon people are of herbs and part used are the leaves. This indicates a potential of large scale and sustainable utilization of these medicinal plants for drug development. In contrast, species for which the medicinal preparation require the whole plant, root, bark, rhizome or tuber may be more difficult to grow sustainably, particularly those species that are rarely occurred, slow growing, perennial and under huge market demand. In our study, seven species including *Acorus calamus*, *Centella asiatica*, *Oxystelma esculentum*, *Lasia spinosa*, *Eclipta prostrata*, *Bauhinia acuminata*, *Mimusops elengi* are assigned as Least Concern (LC) and *Zingiber zerumbet* as Data Deficient (DD) based on IUCN Red List of Threatened species (IUCN, 2020). Moreover, the information on the status of other medicinal plants and their market demand is largely lacking. In our investigation, for example, the root of *Streptocaulon juvenas* is used for treating cancer, cancerous tumor and other various diseases. This species is reported to be more and more difficult to be found in recent decades by the informants, and its value has increased up to MMK 18750/kg (approximately US\$ 13/kg). The decline of this resource is said by some informants to result from habitat loss due to farmland and rubber plantation, as well as the destructive harvesting method of uprooting. However, the status of the resource, and the reasons driving change remain un-studied. Therefore, the monitoring of the status of these resources, the market trends, and the balance between demand and supply of such species are recommended in the future to ensure their sustainable use.

5.2 Thirteen new records of medicinal plants and their related studies

Our study documented 13 species as new records of medicinal plants in Myanmar. The medicinal use of *P. lucidissimus* and *H. verticillata* have not been reported in the literature. However, *H. bonariensis* Comm. Ex Lam in the same genus, is widely used in western Nigeria in treating ophthalmic diseases and has been reported to protect against galactose-induced cataract on wistar rats' model (Ajani et al., 2009). *H. verticillata* showed high consensus with 29 URs in our study; and the decoction of its rhizome, leaf and whole plant are reported to treat eye diseases (13 URs).

The uses of *U. littoralis* (syn: *U. macrophylla*) as medicine been widely documented in literatures (Chen, 2012; Wang S, 2005; Zafra-Polo, 1998; Zhu XY, 2011). For example, the decoction of its leaf and root are used to treat traumatic injury, rheumatism, anemia by Hoklos people on Hainan Island, China (Li, 2016). *E. foetidum* is used as a medicinal plant in most tropical regions (Paul, 2011). Local people in Northeast India use it as food with medicine value (Prasad, 2008). This plant is used for burns, earache, fever, hypertension, constipation, fits, asthma, stomach ache, worms, infertility complications, snake bites,

diarrhea and malaria (Paul, 2011). *Dieffenbachia* is an ornamental plant and the family it belongs to are known to be poisonous (Fochtman, 1969; Pamel, 1911). The leaves of *D. seguine* are used to treatment mycosis (Vásquez-Ocmín, 2018). *P. indica* is a popular medicinal plant used in Southeast Asia. In Thailand, the leaves were reported to possess anti-inflammatory, antinociceptive, anti-tuberculosis properties and are used for leucorrhea, inflammation and lumbago diseases. The stem and the bark are used for kidney stones and haemorrhoid diseases respectively (Suriyaphan, 2014). *T. zebrina* species have used for a variety of medicinal purposes all over the world. It is used to treat skin diseases and cold (Moehring, 2013). The leaf and flower decoction are used for curing gastritis, internal infections, relaxant diseases by inhabitants of Loja and Zamora (Tene, 2007). *P. volubilis* is native to the tropical rain forest of the Amazon region of South America (Duke, 1994), and is used as food, medicine and cosmetic. This plant has different antioxidant, antibacterial, antidyslipidemic, and anticancer properties (Wang, 2018). *D. trifoliata* is commonly used as insecticides (Suganya, 2014). The leaves are used to treat various ailments including antispasmodic, counter-irritant, rheumatism, chronic paralysis, and dysmenorrhea. Moreover, it has stimulant effect. The root decoction of this plant is used against fever and internally against sores. The roots and/or stems are used as laxative, carminative, and anti-arthritic agents (Orwa, 2009). *E. bulbosa* is widely cultivated all over the world, especially in Africa and Asia (Rani, 2016). The bulbs of *E. bulbosa* were widely used as a medicine in China and Southeast Asia (Shi, 2019) for treating hemoptysis, dysentery, irregular menstruation, abdominal pain, traumatic injury and sore boil (Min, 2015). *L. floribunda* is known as ornamental plant and it is native to subtropical and tropical South-East Asia, from southern China to Myanmar, Thailand, Cambodia, Indo-China and Peninsular Malaysia. The roots are used to treat stomach problems. The tea of the leaves is used for treating diabetes mellitus, weight loss, lower blood sugar and urinary problems (Sikarwar, 2016). *P. pellucida* is used to treat abscesses, boils and skin wounds, and eye inflammation. According to the literatures, this plant has anti-microbial (Bojo, 1994) and anti-inflammatory and analgesic activity (De Fátima Arrigoni-Blank, 2004). Several studies have reported medicinal uses of *L. alba*. For example, Leaves uses in hypertension, digestive problems, nausea and cold, cough and bronchitis (Di Stasi, 2002) and the leaves of this species were most cited by traditional healers as active against gastrointestinal troubles in Mexico (Heinrich, 1992).

5.3 Methods of preparation

Decoction, juice, food, powder and infusion are the most popular traditional methods to prepare the medicinal plants by Mon people. Interestingly, preparation method using rice water documented in present study is not recorded from elsewhere in the world. Rice water in this context refers to the water used to rinse rice before cooking. Normally, the rinsing water of the second time is used for processing medicine as it is considered clean. In Mon State, the root decoction of *Lagerstroemia floribunda* and *Millingtonia hortensis*, which are used to treat cancer and hypertension, are soaked in rice water for several hours prior to the preparation of a decoction. In addition, the remaining solution of the rice water can be applied on skin for treating acne and herpes. In many cases, the mode of preparation of a given species determines the type of disease it treats. For example, leaf decoction of *Acalypha indica* is used for treating asthma, while leaf juice is used for treating earache. The

powder mixtures of remedies using multi-plant formula are commonly found in the medicinal markets and in the clinics of herbal doctors for treating dysentery, piles and diabetes. They are either sold into small paper packages with simple explanations or contained in big plastic/glass bottles and prescribed by herbal doctors. As in many parts of Southeast Asia, some medicinal plants including *Wattakaka voubilis*, *Centella asiatica* and *Leucaena leucocephala* are freshly consumed as vegetables in combination with fish paste. Those medicinal plants with bitter taste such as *Tinospora sinensis* and *Millingtonia hortensis* are generally prepared with sweet ingredients such as palm sugar, honey and syrup.

5.4 Most prevalence diseases treated by Mon traditional medicinal plants (MTMs)

Digestive (251 URs), urological (156 URs), and respiratory (135 URs) were the most prevalent diseases with rich information on therapeutic treatments using MTMs. This is highly consistent with the hospital statistical reports of Myanmar in 2016, where digestive (9.4%/8.7%) and respiratory (7.9%/7.7%) system diseases were listed as top 10 diseases in terms of morbidity and mortality rates (Health Information Division, 2018). In the category of digestive disease, the most cited problems include constipation (42 URs), jaundice (36 URs) dyspepsia (29 URs), flatulence (25 URs), abdominal pain (17 URs) etc. Likewise, dysuria (73 URs), gall stone (29 URs) and urinary tract infection (25 URs) for urological diseases, and cough (101 URs) for respiratory diseases. The causes of these diseases were not queried in the survey and also were not found in any literature. However, studies assessing health indicators for the universal health coverage in Myanmar showed problems of inadequate sanitation facility and indoor use of solid fuel (Han et al., 2018), which might provide certain clues. These two factors should further be evaluated in the future with relation to the above-mentioned diseases, especially digestive and respiratory diseases. Sixty plant species were reported to treat digestive diseases, with *Senna alata* (L.) Roxb. (35 URs), *T. sinensis* (Lour.) Merr. (20 URs), *Glinus oppositifolius* (L.) A. DC. (12 URs), *Phyllanthus niruri* L. (11 URs) and *Alysicarpus vaginalis* (L.) DC. (10 URs) as the most cited ones. Likewise, 28 species and 31 species were reported to treat respiratory and urological disease, with *C. odorata* (L.) R.M. King & H. Rob (34 URs), *T. triquetrum* (L.) H. Ohashi (27 URs), *Senegalia rugata* (Lam.) Britton & Rose (12 URs), and *M. pudica* L. (41 URs), *A. vaginalis* (L.) DC. (31 URs), *T. triquetrum* (L.) H. ohashi (13 URs), *Aloe vera* (L.) Burm.f. (10 URs) being the most cited.

Apart from the most prevalent diseases reported in current study, HIV, malaria and tuberculosis are the top concerns of the Myanmar Health Department. In our study, 11 and 13 user reports were collected for malaria and tuberculosis respectively, and no user report for HIV. Seven plant species, including *Alstonia scholaris* (L.) R. Br. (3 URs), *Piper longum* L. (2 URs), *P. nigrum* L. (2 URs), *Acalypha indica* L. (1 UR), *Azadirachta indica* A. Juss. (1 UR), *Bauhinia acuminata* L. (1 UR) and *Plumeria alba* L. (1 UR) were reported to treat malaria; four species including *Tadehagi triquetrum* (L.) H. Ohashi (7 URs), *Chromolaena odorata* (L.) R. M. King & H. Rob. (2 URs), *Garcinia pedunculata* Roxb. Ex Buch. - Ham. (2 URs) and *Morinda citrifolia* L. (1 UR) were reported to treat tuberculosis. The relatively small number of use reports for these nationally recognized diseases of concern reported in the current study could be related to the high-level input of government interventions and reduction measures with support from international partners, thus creating less dependence

on traditional medicine. For example, reduction rates on the morbidity/mortality of malaria was 81.1%/93.5% in Myanmar, and 94.4%/98.5% in Mon State during the period of 2005-2014, as the result of an increase of trained malaria-specific health workers, application of insecticide-treated bed nets, and provision of artemisinin-based treatment (Mu et al., 2016).

5.5 Five most cited medicinal plants and their applications

Tinospora sinensis (Menispermaceae) (**Appendix, SN 114**), “Sin-don-manwe” in Burmese language, a woody climber, is a well-known medicinal plant commonly seen in Myanmar. It is also widely used in India (Banerjee et al., 2020) and China (Shi et al., 2017) for various diseases. In our study area, the informants reported that the root and stem are used for treating diabetes, hypertension, tonic, longevity, dyspepsia, flatulence, paralysis, joint ache, gastritis, bone fracture, malaria, abdominal pain, liver disease, eye disease and cough. Based on the quantitative evaluation, the highest FL value (45.1%, **Table 4**) occurred for diabetes, which have been scientifically tested and proofed in recent years (Banerjee et al., 2020). The FAME Company in Myanmar has developed a product “Tinoflam” using *T. sinensis* as the major component for treating anti-inflammatory. Concerns have arisen about its sustainability among some informants interviewed, as it is mainly sourced from wild habitats. Fourteen out of 52 informants who cited this species declared that it is becoming more difficult to find. Nine of them mentioned that the population of the species is declining and five of them attributed the decline to the loss of habitat due to land use change from forest to rubber plantation. Moreover, *T. sinensis* is marketable along with 23 others out of 158 species reported in this study. As we have observed from local market near Kyaiktyo Pagoda, large amounts of *T. sinensis* were extracted and sold in the market with a price of MMK 6250/ kg (approximately US\$ 2.78/ kg) in dry weight. However, the information on the status of the resource and the trend of market demand is not available. Therefore, the sustainability of the current trade is unknown. Given its commercial value, however, there is a need for regular monitoring of its abundance and market demand.

Chromolaena odorata (Asteraceae) (**Appendix, SN 36**) is commonly known as an invasive weed. It is native to central and South America and is now distributed throughout Africa and tropical Asia (Muniappan & Marutani, 1991). Recently, however, Vijayaraghavan et al (2017) reviewed the pharmacological activities and chemical constituents of this species. They pointed out that current focus on the species might have been distracted by its invasive notoriety but its wide spectrum of pharmacological activities has been neglected. The wound healing property of *C. odorata* is widely acknowledged in Thailand, India, and Vietnam, and imbedded into their traditional medical system (Vijayaraghavan et al., 2017), which is also supported by our study. In Myanmar it is called “Bizat”, with a high consensus of using it for cuts and wounds (FL=52.46%, **Table 4**) among Mon people surveyed. Based on the survey, local people use the whole plant and leaf extract for a number of uses including cuts and wounds, cough, fever, longevity, tuberculosis, hepatitis B virus, blood cough, hypertension, internal pain, cancer, internal organ cancer, liver disease, herpes. However, based on local knowledge, caution should be paid when taking it, as an overdose can be poisonous. Further safety and efficacy evaluations of *C. odorata* should be encouraged in the future.

Mimosa pudica (Fabaceae) (**Appendix, SN 81**), “Hti ka yone” in Burmese language and “Hta muck” in Mon, is commonly found along the road-sides, home compounds, and farm

land in Mon State. Globally, this ornamental plant is known for its thigmonastic and nyctinastic movement. It is, however, a highly valued medicinal plant with great pharmaceutical potentials, as reviewed by Muhammad et al (2016), alkaloid and mimosine together with tannins, steroids, flavonoids, triterpenes and glycosylflavones are the important compounds corresponding to a wide range of pharmacological activities including antioxidant, antibacterials, antifungal, anti-inflammatory, hepatoprotective, antinoiceptive, anticonvulsant, antidepressant, antidiarrheal, diuretic, antimalarial, and hypoglycemic. It is widely used by Mon people for treating dysuria, urinary tract infection, jaundice, cough, cuts and wounds, edema, fever, ulcer. The highest consensus of using this plant by Mon people is to treat dysuria with FL of 71.74% (**Table 4**). The abundance, wide distribution and easy collection of this species make it a good potential resource that can be integrated into national drug development and community-based livelihood programs. The FAME Company in Myanmar has developed a product “Herbal Sleep” using *Valeriana officinalis*, *Valeriana wallichii*, *M. pudica*, *Withania somnifera* as the treatment for insomnia, stress and anxiety, neuro fatigue.

Tadehagi triquetrum (Fabaceae) (**Appendix, SN 87**) called “Lauk thay” in Burmese, is abundantly distributed along road sides and home compounds in Mon State. Myanmar people use the leaves to cover fish paste (ngapi in Burmese) for keeping it free from fly larvae (Aye et al., 2019). In our survey, whole plants and leaves were used for cough, dysuria, tuberculosis, asthma, weight loss, haematemesis, hepatitis B virus, hepatitis C virus, renal disease, and urinary tract infection. Using this species to treat cough had the highest consensus in our survey with FL value of 52.17 % (**Table 4**). Tea or infusion of leaves and whole plant were also prepared by some local people for a wide range of therapeutic usages including dysuria, tuberculosis, weight loss, haematemesis, hepatitis B virus, hepatitis C virus, renal disease and urinary tract infection. Recently, several ethnopharmacological studies of *T. triquetrum* have been conducted. Many new chemical compounds such as tadehaginosin (Wu et al., 2015) and phenylpropanoid glucosides (Zhang et al., 2016), prenylated isoflavones and prenylated biisoflavanone (Xiang et al., 2005) were discovered, which presented antidiabetic and antihelminthic potentials. Antidiabetic (Zhang et al., 2015) and antihelminthic (Tang et al., 2014) effects and the mechanism of tadehaginoside extracted from *T. triquetrum* have also been studied.

Alysicarpus vaginalis (Fabaceae) (**Appendix, sequence SN 73**) is called “Than-ma-naing-kyauk-ma-naing” in Burmese language. In Mon State, the whole plant is used for gall stone, dysuria, jaundice, urinary tract infection, renal disease, asthma, and cough. The FAME Company produces a herbal medicine “Urocrush” for treating renal stone with *A. vaginalis* as ingredient. However, our informants used this species for gall stone treatment with FL of 31.43%, (**Table 4**). Although it has also been recorded in other countries as a traditional medicine for various diseases, the pharmacology of this species is generally lacking (Tapadiya et al., 2017). More and in-depth research to explore the phytochemical and bioactivity of *A. vaginalis* should be encouraged in the future.

6. Conclusion

This is the first quantitative ethnobotanical study into the medicinal plants and traditional knowledge of the Mon people. We documented 158 plant species used by the surveyed Mon informants, of which 13 species can be added to the inventory of medicinal plants in Myanmar. These medicinal plants are mainly used to treat digestive, urological and respiratory diseases. *T. sinensis*, *C. odorata*, *M. pudica*, *T. triquetrum* and *A. vaginalis* were the most cited medicinal plants, and were used by the Mon people to treat dysuria, cuts and wounds, cough, diabetes and gall stones respectively. To ensure a better use of Mon traditional medicinal plants, we suggest further research into: 1) the resource status of *T. sinensis*; 2) the phytochemical and pharmacological characteristics of the less studied species such as *A. vaginalis*; and 3) investigations into the potentials of *T. sinensis*, *C. odorata*, *M. pudica*, and *T. triquetrum* for drug development.

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Appendix

Ethnobotanical information of medicinal plants used by Mon people

SN	Family	Scientific name/ Conservation Status	Burmese Name in english and Mon Name in English	Burmese Name	Life form	Plant parts used	Preparation method	Administration method	Medicinal uses with ICPC category	URs disease	Voucher no.
1	Acanthaceae	<i>Acanthus ilicifolius</i> L.	Kha-yar (B)	ခရာ	Sh	Wp	Dec	Oral	Hypertension (K)	2	EB 180597
2	Acanthaceae	<i>Andrographis paniculata</i> (Burm.f.) Nees	Nga-yote-kha (B)	ငရုတ်ခါး	Sh	L	Dec	Oral	Cough (R)	2	EB 180370
						Wp	Dec	Oral	Diabetic (T)	5	
						Wp	Dec, Pow	Oral	Fever (A)	6	
3	Acanthaceae	<i>Barleria prionitis</i> L .	Leik-su-shwe-war (B)	လိပ်ဆူးရွှေဝါ	Sh	L	Dec	Oral	Blood cough (R)	6	EB 180593
						L, Wp	Dec	Oral	Jaundice (D)	2	
						L, Wp	Jan	Oral	Haemorrhoid (K)	2	
						L, Wp	Dec	Oral	Cough (R)	1	
4	Acanthaceae	<i>Dicliptera</i> sp.	Kyamote-seik (B)	ကျားမုတ်ဆိတ်	H	Rt	Dec	Oral	Edema (U)	1	EB 180537
5	Acanthaceae	<i>Hygrophila auriculata</i> (Schumach.) Heine	Sue-padaung (B)	ဆူးပဒေါင်း	H	Wp	Dec	Oral	Edema (U),	2	EB 180367
						Wp	Dec	Oral	Jaundice (D)	1	

6	Acanthaceae	<i>Justicia adhatoda</i> L.	Maya-gyi (B), Hla brairot (M)	မုယားကြီး	H	Wp	Jan	Oral	Diabetic (T)	1	EB 180356/ 529
						L	Dec	Oral	Cough (R)	3	
						L	Dec	Oral	Paralysis (N)	2	
7	Acanthaceae	<i>Rhinacanthus nasutus</i> (L.) Kurz	Htaw-labat (B)	ထောလပတ်	Sh	L	Jui	Top	Menstrual disorder (X)	1	EB 180531
									Hair growth (S)	1	
8	Acoraceae	<i>Acorus calamus</i> L. (LC)	Lin-lay (B)	လင်းလေ	H	Rt	Food	Oral	Fever (A)	1	EB 180524
						Rt	Jui	Oral	Gastritis (D)	1	
						Rt	Jui	Top	Bone fracture (L)	2	
9	Amaranthaceae	<i>Achyranthes aspera</i> L.	Kyet-mauk-supyan (B)	ကြက်မောက်ဆူးပြန်	H	Wp	Dec	Oral	Edema (U)	1	EB 180476
10	Amaryllidaceae	<i>Crinum asiaticum</i> L.	Ko-yan-gyi (B)	ကိုယ်ရံကြီး	H	L	Roa, Jui	Top	Knee pain (R)	1	EB 180365
						L	Roa, Jui	Top	Low back pain (R)	1	
11	Anacardiaceae	<i>Spondias pinnata</i> (L. f.) Kurz	Gwe-thi (B)	ပွေးသီး	T	Fr	Food	Oral	Dyspepsia (D)	1	EB 180543
						Rt, L	Dec	Oral	Dysentery (D)	1	
						Rt, L	Dec	Oral	Earache (H)	1	
12	Annonaceae	<i>Annona muricata</i> L.	Duyin-awza (B)	ဒူးရင်းဩဇာ	T	L	Dec	Oral	Cancer (B)	1	EB 180424
13	Annonaceae	<i>Uvaria littoralis</i> (Blume)	Thabut-mae thi (B)	သပွတ်မဲသီး	T	R Fr	Food	Oral	Constipation (D)	1	EB 180432/ 552

Blume											
14	Apiaceae	<i>Centella asiatica</i> (L.) Urb. (LC)	Myin-khwa (B), Hlahnip chai (M)	မြင်းခွာ	H	L	Dec	Oral, Nas	Diarrhoea (D)	1	EB 180471
						L	Dec	Oral, Nas	Dyspepsia (D)	1	
						Fr		Nas	Dizziness (N)	1	
						L		Top	Scar (S)	1	
						L, Wp	Dec, Food	Oral	Eye disease (F)	6	
						L, Wp	Dec, Food	Oral	Poor eye sight (F)	7	
						Rh	Pow, Hon		Tonic (T)	3	
						Wp	Dec, Syr	Oral	Adominal pain (D)	2	
						Wp	Dec	Oral	Jaundice (D)	2	
						Wp	Dec	Oral	Reduce body heat (A)	1	
						L	Food	Oral	Good for eye sight (F)	1	
						Wp	Dec	Oral	Asthma (R)	1	
						L	Dec	Oral	Menstrual disorder (X)	1	
15	Apiaceae	<i>Eryngium foetidum</i> L.	Shan-nan-nan (B)	ရှမ်းနံနံ	H	L	Food	Oral	Hypertesion (K)	1	EB 180368
16	Apocynaceae	<i>Alstonia scholaris</i> (L.) R. Br	Taung-mayoe (B), Sotsay one (M)	တောင်မရိုး	T	L, Lat, B	Dec, Ins	Oral	Malaria (A)	3	EB 180610
						B	Dec	Oral	Fever (A)	2	
						St	Dec	Oral	Gastritis (D)	1	
						B	Pow	Oral	Dyspepsia (D)	1	
						St	Dec	Oral	Weight loss (T)	1	

17	Apocynaceae	<i>Calotropis gigantea</i> (L.) W. T. Aiton	Yoe-gyi (B)	ရိုးကြီး	Sh	Lat	Jui	Top	Skin disease (S)	1	EB 180568
18	Apocynaceae	<i>Oxystelma esculentum</i> (L. f.) Sm. (LC)	Kouk-yoenwe (B)	ကောက်ရိုးနွယ်	V	L	Dec, Ins	Oral	Lactation (W)	2	EB 180380
19	Apocynaceae	<i>Periploca</i> sp.	Taw-sabal (B)	တောစံပယ်	H	L	Dec	Oral	Tonic (T)	1	EB 180501
20	Apocynaceae	<i>Plumeria alba</i> L.	Tayoke-sagar-akyaw (B)	တရုတ်စကား အကျော်	T	B	Dec	Oral	Malaria (A)	1	EB 180436
21	Apocynaceae	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz (EN)	Bonma-yaza (B)	ဘုံမရာဇာ	Sh	Rt	Pow	Oral	Cancerous tumour(B) Longevity (A)	1	EB 180577
22	Apocynaceae	<i>Streptocaulon juvenas</i> (Lour.) Merr.	Myin-sakone-ni (B)	မြင်းစင်္ဂီ	V	Rt	Dec	Oral	Abdominal pain (D)	1	EB 180412
						Rt	Pow	Oral	Dyspepsia (D)	1	
						Rt	Pow	Oral	Flatulence (D)	1	
						Rt	Pow	Nas, Bat	Paralysis (N)	1	
						Rt	Jui, Dec, Pow	Top, Oral	Cancer (B)	5	
						Rt	Dec	Oral	Cancerous tumour (B)	4	
						Rt	Dec, Ins	Oral	Adominal pain (D)	4	
						Rt	Dec	Oral	Gastric cancer (D)	1	
						Rt	Dec	Oral	Hepatitis (D)	1	
						Rt	Dec, Pow	Oral.	Hepatitis C virus (D)	1	

23	Apocynaceae	<i>Wattakaka volubilis</i> (L.f.) Stapf	Gwe-dauk (B)	ရွေးတောက်	V	Rt	Dec	Oral	Jaundice (D)	1	EB 180389
						Rt	Dec	Oral	Gastritis (D)	1	
						Rt	Jui, Dec, Pow, Ins, Pas	Top, Oral	Hypertesion (K)	1	
						Rt	Jui	Top	Ulcer (S)	2	
						L	Food	Oral	Internal pain (A)	2	
24	Araceae	<i>Dieffenbachia seguine</i> (Jacq.) Schott	Na-hu-ya (B)	နဟူရာ	H	L	Food	Oral	Antithelminthi c (D)	1	EB 180590
							Roa, Jui	Top	Jointache (L)	2	
									Ulcer (S)	5	
25	Araceae	<i>Lasia spinosa</i> (L.) Thwaites (LC)	Zayit-yoe (B)	ဇေယျိယိုး	H	St	Food, Dec	Oral	Antidote (A)	1	EB 180386
							Food, Dec	Oral	Gastritis (D)	1	
							Food, Dec	Oral	Menstrual disorder (X)	1	
26	Araliaceae	<i>Hydrocotyle verticillata</i> Thunb.	Myin-khwa-gyi (B)	မြင်းခွာကြီး	V	Rh, L, Wp	Dec, Food	Oral	Eye disease (F)	6	EB 180373
						Wp	Dec, Food	Oral	Poor eye sight (F)	7	
						Rh, L, Wp	Dec, Food	Oral	Longevity (A)	4	
						Rh, L, Wp	Dec, Food	Oral	Tonic (T)	3	
						Wp	Dec	Oral	Jaundice (D)	2	
						Rh	Pow, Hon	Oral	Diabetic (T)	2	

						Wp	Dec	Oral	Reduce body heat (A)	1	
						Wp	Syrup	Oral	Adominal pain (D)	1	
						Rh, L, Wp	Dec, Food	Oral	Good for eye sight (F)	1	
						Rh, L, Wp	Dec, Food	Oral	Asthma (R)	1	
						L	Dec	Oral	Menstrual disorder (X)	1	
27	Arecaceae	<i>Calamus</i> sp.	Kyein (B)	ကြိမ်	V	L	Dec	Oral	Flatulence (D)	1	EB 180553
28	Aristolochiaceae	<i>Aristolochia indica</i> L.	Eiktharamuli (B), Pacowatsaramuloi (M)	လူသာရမူလီ	V	Wp	Jui	Top	Antidote (A)	1	EB 180357
					V	L	Jui	Top	Mouth ulcer (D)	1	
29	Aristolochiaceae	<i>Aristolochia</i> sp.	Gon-khar (B)	ဂုံခါး	V	Rt	Pow	Top	Cancer (B)	1	EB 180584
						Rt, L	Dec	Oral	Cough (R)	1	
						Rt	Pow	Top	Gout (T)	1	
						Rt	Pow	Oral	Menstrual disorder (X)	1	
30	Asparagaceae	<i>Asparagus racemosus</i> Willd.	Shin-matet-oo (B)	ရှဉ့်မတက်	H	Tu	Dec, Pow	Oral	Tonic (T)	1	EB 180478
31	Asparagaceae	<i>Cordyline fruticosa</i> (L.) A.Chev.	Zawgyi-taunghwa (B)	ဇော်ဂျီတောင်ပေး	H	L	Dec	Oral	Blood cough (R)	4	EB 180512
						L	Dec	Oral	Haematemesis (D)	2	
32	Asparagaceae	<i>Dracaena canaliculata</i>	Sin -swalgamon (B)	ဆင်စွယ်ဂမုန်း	H	Wp, L	Food	Oral	Haemorrhoid (K)	4	EB 180492

		(Carrière) Byng & Christenh.									
33	Asparagaceae	<i>Dracaena trifasciata</i> (Prain) Mabb.	Nga-set (B)	နဂါးစက်	H	Rh	Hon, Pow	Oral	Hypertesion (K)	1	EB 180387
						Rt, L	Jui, Pow	Top, Oral	Cancerous tumour (B)	1	
						Rt, L	Jui, Pow	Top, Oral	Scar (S)	1	
						Rt, L	Jui, Pow	Top, Oral	Cuts and wounds (S)	1	
						Rt	Food	Oral	Constipation (D)	1	
34	Asphodelaceae	<i>Aloe vera</i> (L.) Burm.f.	Shazaung-letpat (B), Men kharkeek leck chuck (M)	ရှားစောင်းလက်ပက်	H	C	Food, Jui	Oral	Dysuria (U)	5	EB 180376
						C	Food, Jui	Oral	Gall stone (U)	3	
						C	Food, Hon, Syr	Oral	Urinary tract infection (U)	2	
						C	Food, Syr	Oral	Menstrual disorder (X)	3	
						C	Jui	Oral	Cough (R)	2	
						C	Food, Jui	Oral	Diabetic (T)	2	
						C	Food, Jui	Oral, Top	Haemorrhoid (K)	1	
						C	Food, Jui	Oral, Top	Heart disease (K)	1	
						C	Jui	Top	Burns (S)	1	
						C	Jui	Top	Burns (S)	1	

35	Asteraceae	<i>Blumea balsamifera</i> (L.) DC.	Phone-mathein (B)	ဖိုးမသိမ်	Sh	L	Dec	Oral, Bat	Paralysis (N)	4	EB 180503
						L	Dec, Ins, Bat	Oral	Menstrual disorder (X)	1	
36	Asteraceae	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Bizat (B)	ဘိစင်	Sh	L, Wp	Jui	Top	Cuts and wounds (S)	32	EB 180401
						L, Wp	Dec	Top, Oral	Cough (R)	31	
						L, Wp	Dec	Top, Oral	Fever (A)	1	
						L, Wp	Dec	Top, Oral	Longevity (A)	1	
						L, Wp	Dec, Jui	Top, Oral	Tuberculosis (A)	2	
						L, Wp	Dec, Ins	Oral	Hepatitis B virus (D)	3	
						L, Wp	Dec	Oral	Blood cough (R)	3	
						L, Wp	Dec	Oral	Hypertesion (K)	1	
						L, Wp	Dec	Top, Oral	Internal pain (A)	1	
						Wp	Dec, Jui	Top, Oral	Cancer (B)	1	
						L, Wp	Dec	Oral	Internal organ cancer (B)	1	
						L, Wp	Dec	Oral	Liver disease (D)	1	
						L, Wp	Jui	Top	Herpes (S)	1	
37	Asteraceae	<i>Eclipta prostrata</i> (L.) L. (LC)	Kyeik-hman (B)	ကြိတ်မှန်	H	L	Jui	Top	Scar (S)	19	EB 180388
						L	Jui, Dec	Oral	Blood circulation (A)	5	
						Wp, L	Jui, Dec	Oral	Flatulence (D)	1	

						Wp	Jui	Eye	Eye disease (F)	1	
						L	Dec	Oral	Cough (R)	1	
						Wp	Dec, Pas	Top, Oral	Menstrual disorder (X)	1	
38	Asteraceae	<i>Elephantopus scaber</i> L.	Khu-min (B)	ခူမင်း	H	L, Rt	Jui	Top	Ulcer (S)	5	EB 180450
39	Asteraceae	<i>Galinsoga</i> sp.	Kwe-thay-pan (B)	ခွေးသေးပန်း	H	Wp	Jui	Top	Ulcer (S)	1	EB 180446
40	Asteraceae	<i>Gynura procumbens</i> Merr.	Pyamee-swae (B)	ပျားမြီးဆွဲ	H	L, Wp	Dec, Food	Oral	Hypertesion (K)	4	EB 180366
						L	Dec, Ins	Oral	Fever (A)	2	
						L	Dec, Food	Oral	Diabetic (T)	4	
						L	Dec, Ins, Food, Roa, Jui	Oral	Urinary tract infection (U)	2	
						L	Dec, Ins, Food, Roa, Jui	Oral	Cancer (B)	1	
						L	Dec, Ins, Food, Roa, Jui	Oral	Dysentery (D)	1	
						L	Dec	Oral	Liver disease (D)	1	
41	Asteraceae	<i>Pluchea indica</i> (L.) Less.	Kha-lu (B)	ခလူ	Sh	L	Food	Oral	Constipation (D)	1	EB 180598
42	Asteraceae	<i>Spilanthes</i> sp.	Bizat-war (B)	ဘိစပ်ဝါ	H	Rt, L, Fl, Wp	Dec, Jui	Oral, Top, Bat	Toothache (D)	7	EB 180379
43	Bignoniaceae	<i>Fernandoa adenophylla</i> (Wall. ex	Phet-than (B)	ဖက်သန်း	T	Rt	Dec	Oral	Longevity (A)	2	EB 180462

		G.Don) Steenis										
						Rt	Dec	Oral	Cough (R)	2		
						Rt	Dec	Oral	Tonic (T)	1		
44	Bignoniaceae	<i>Millingtonia hortensis</i> L.f.	Egayit (B)	ဧကရာဇ်	T	Rt	Dec, Syr, Ric	Oral	Hypertesion (K)	3	EB	180466
45	Bignoniaceae	<i>Oroxylum indicum</i> (L.) Kurz	Kyaung-sha (B), Sot gren itg (M)	ကြောင်လျှာ	T	Fr, Fl	Food	Oral	Earache (H)	11	EB	180428
						L, Fr, B	Jui, Food, Pow, Dec	Top, Oral	Renal disease (U)	2		
						L, Fr	Food	Oral	Flatulence (D)	1		
						Fr, B	Jui	Top	Ulcer (S)	1		
						B	Pow	Top	Gout (T)	1		
46	Boraginaceae	<i>Heliotropium indicum</i> L.	Sin-hna-maung (B), Men khareek chuck twe (M)	ဆင်နှာမောင်း	H	Wp	Dec, Ins	Oral	Hepatitis B virus (D)	4	EB	180440
						Wp	Dec	Oral	Jaundice (D)	1		
						Wp	Dec, Ins, Pas	Oral, Top	Renal disease (U)	2		
						Rt	Dec, Bat	Oral	Gall stone (U)	2		
						Wp	Dec	Oral	Internal pain (A)	1		
						Rt	Dec	Oral, Top	Diabetic (T)	1		
						Wp	Dec	Oral, Top	Urinary tract infection (U)	1		
47	Bromeliaceae	<i>Ananas comosus</i> (L.)	Na-nat (B)	နာနတ်	H	Rt	Dec	Oral	Edema (U)	2	EB	180554

48	Capparaceae	Merr.	Kadat (B)	ကဒတ်	T	L	Dec	Oral	Gall stone (U)	1	EB 180447
		<i>Crateva religiosa</i> G.Forst.				B	Dec	Oral	Internal organ cancer (B)	3	
						B	Jui	Top	Fever (A)	1	
						Rt	Food, Pow	Oral	Paralysis (N)	1	
						B	Pow	Oral	Gout (T)	1	
49	Caricaceae	<i>Carica papaya</i> L.	Thin-baw (B)	သဘော	T	L, Fr	Dec, Food, Ins	Oral	Cancer (B)	4	EB 180549
						L, Fr	Dec, Food	Oral	Ulcer (S)	1	
						L, Fr	Dec, Food	Oral	Diabetic (T)	1	
50	Clusiaceae	<i>Garcinia mangostana</i> L.	Min-gut (B), Sot mengoot (M)	မင်းကွတ်	T	Fr c	Jui	Oral	Diarrhoea (D)	2	EB 180541
						Fr c	Jui	Oral	Dysentery (D)	2	
						Fr c	Jui	Top	Pruritus (S)	1	
51	Clusiaceae	<i>Garcinia pedunculata</i> Roxb. ex Buch.-Ham.	Met-lin-chin (B), Sot menlorn (M)	မက်လင်ချဉ်	T	Fr	Dec, Ins	Oral	Jaundice (D)	3	EB 180540
						R Fr, L	Dec	Oral	Dysuria (U)	2	
						Fr	Dec, Ins, Food, Bat	Oral	Hepatitis B virus (D)	2	
						Fr	Dec	Oral	Tuberculosis (A)	2	
						R Fr,	Dec,	Oral	Flatulence (D)	1	

52	Combretaceae	<i>Terminalia catappa</i> L. (LC)	Bandar (B), Mai bunder (M)	ဗန်ဒါ	T	L	Food				
						L	Food, Dec	Oral	Dysentery (D)	4	EB 180539
						L	Roa	Top	Rheumatism (R)	1	
53	Combretaceae	<i>Terminalia chebula</i> Retz.	Phan-kha (B)	ဖန်းခါး	T	Se	Jui, Food	Eye, Oral, Top	Eye disease (F)	1	EB 180414
						Fr	Food, Pow	Oral	Dyspepsia (D)	1	
						Fr	Ins, Dec	Oral	Menstrual disorder (X)	1	
54	Commelinaceae	<i>Tradescantia spathacea</i> Sw.	Mi-kween-gamon (B)	မီးကွင်းဂမုန်း	H	L	Dec, Ins	Oral	Haemorrhoid (K)	7	EB 180497
						L	Dec, Ins	Oral	Dysentery (D)	1	
						Wp	Dec	Oral, Nas	Leukaemia (B)	1	
						L	Dec	Oral	Hypertesion (K)	2	
						L	Dec	Oral	Blood cough (R)	1	
						L	Dec, Ins	Oral	Diabetic (T)	4	
						Rt	Dec	Oral	Cough (R)	2	
						55	Commelinaceae	<i>Tradescantia zebrina</i> Bosse	Yae-war (B)	ရေဝါး	H
L	Dec	Oral	Edema (U)	1							
L	Dec	Oral	Intrahepatic stone (U)	1							
L	Dec	Oral	Gall stone (U)	1							
56	Convolvulaceae	<i>Ipomoea batatas</i> (L.) Lam.	Ka-zun (B), Woontie (M)	ကန်စွန်း	H	L	Pow, Food	Oral, Top	Antidote (A)	1	EB 180382

57	Crassulaceae	<i>Kalanchoe integra</i> (Medik.) Kuntze	Ywet-kya-pin-pauk (B)	ရွက်ကျပင်ပေါက်	H	L	Jui	Top	Ulcer (S)	1	EB 180559
						L, Lat, B	De, Ins	Top, Oral	Cuts and wounds (S)	1	
58	Cucurbitaceae	<i>Benincasa hispida</i> (Thunb.) Cogn.	Kyauk-phayon (B)	ကျောက်ဖရုံ	V	Wp	Dec, Food	Oral	Dysuria (U)	1	EB 180488
						Wp	Dec, Food	Oral	Urinary tract infection (U)	1	
59	Cucurbitaceae	<i>Coccinia grandis</i> (L.) Voigt	Kin-pone (B), Hla paroop (M)	ကင်းပုံ	V	L, Fr	Food	Oral	Diabetic (T)	1	EB 180612
60	Cucurbitaceae	<i>Momordica charantia</i> L.	Kyet-hinkhar (B)	ကြက်ဟင်းခါး	V	Fr	Dec, Food	Oral	Hypertesion (K)	3	EB 180526
						Fr	Dec, Food	Oral	Diabetic (T)	3	
						Fr	Food	Oral	Cancer (B)	1	
61	Cucurbitaceae	<i>Trichosanthes tricuspidata</i> Lour.	Kyee-arr (B)	ကျီးအာ	V	Wh	Jui	Oral, Top	Antidote (A)	1	EB 180514
62	Dioscoreaceae	<i>Dioscorea</i> sp.	Moh-kyibaung (B)	မိုးကျီးပေါင်း	V	Wp	Jui	Top	Bone fracture (L)	1	EB 180604
						Wp	Jui	Top	Jointache (L)	1	
63	Dioscoreaceae	<i>Dioscorea wallichii</i> Hook.f.	Kadat (B)	ကဒတ်	V	B	Dec	Oral	Internal organ cancer (B)	3	EB 180515
						B	Jui	Oral	Fever (A)	1	
						Rt	Pow, Food	Oral	Paralysis (N)	1	
						B	Pow	Oral	Gout (T)	1	

64	Dioscoreaceae	<i>Tacca chantrieri</i> André	Zawgyi-mote-seik (B)	ဇော်ဂျီမုတ်ဆိတ်	H	L, Wp	Dec, Roa, Jui	Oral, Top	Cancer (B)	1	EB 180351
65	Euphorbiaceae	<i>Acalypha indica</i> L .	Kyaung-yothay (B)	ကြောင်ရီသေ	H	L, Wp	Dec, Ins, Pow	Oral	Asthma (R)	2	EB 180523
						L, Wp	Dec, Ins, Hon, Jui	Oral, Ear	Cough (R)	2	
						L, Wp	Dec, Ins, Hon, Jui	Oral, Ear	Tuberculosis (A)	1	
						L, Wp	Dec, Ins, Hon, Jui	Oral, Ear	Earache (H)	2	
						L, Wp	Dec, Ins, Pow	Oral, Ear	Blood cough (R)	1	
66	Euphorbiaceae	<i>Baliospermum solanifolium</i> (Burm.) Suresh	Hnat-cho (B)	နှပ်ချို	Sh	Rt	Jui	Top	Cancerous tumour (B)	1	EB 180487
						Rt	Jui	Top	Ulcer (S)	1	EB 180487
67	Euphorbiaceae	<i>Croton persimilis</i> Müll.Arg.	Thet-yin-gyi (B), Ca sauboh (M)	သက်ရင်းကြီး	T	L	Dec	Oral	Paralysis (N)	3	EB 180421
						L	Dec, Ins	Oral	Jointache (L)	2	
						Rt	Jui	Top	Edema (U)	1	
						Rt	Jui	Top	Adominal pain (D)	2	
						Rt	Jui	Top	Edema (U)	1	
						Rt	Ric	Oral	Obesity (T)	1	
						L	Dec, Ins	Oral	Menstrual disorder (X)	1	
68	Euphorbiaceae	<i>Euphorbia milii</i> Des Moul.	Shazaung-tinganeah (B)	ရှားစောင်းသိင်္ဂီနိတ်	Sh	L	Food	Oral	Dysentery (D)	1	EB 180377
						L	Dec,	Oral	Haemorrhoid	4	

					Food				(K)		
69	Euphorbiaceae	<i>Euphorbia tithymaloides</i> L.	Gon-ga-man (B)	ဂုံဂမာန်	Sh	L	Roa, Jui	Top	Burns (S)	2	EB 180463
						L	Roa, Jui	Top	Ulcer (S)	2	
70	Euphorbiaceae	<i>Jatropha multifida</i> L.	Say-ma-khan (B)	စေးမခန်း	Sh	L	Dec	Oral	Haematemesis (D)	1	EB 180474
		<i>Jatropha podagrica</i> Hook.	Ta-bin-shwe-htie (B)	တပင်ရွှေထီး	H	Tu	Dec	Oral	Antidote (A)	1	EB 180395
						Tu	Dec, Ins	Oral	Diarrhoea (D)	1	
72	Euphorbiaceae	<i>Plukenetia volubilis</i> L.	Kyae-pae (B)	ကြယ်ပဲ	V	Se	Food	Oral	Eye disease (F)	1	EB 180409
							Roa, Food	Oral	Heart disease (K)	1	
							Roa, Food	Oral	Diabetic (T)	1	
73	Fabaceae	<i>Alysicarpus vaginalis</i> (L.) DC.	Than-ma-naing-kyauk-ma-naing (B)	သံမနိင် ကျောက်မနိင်	H	Wp	Dec, Ins	Oral, Bat	Gall stone (U)	11	EB 180569
						Wp	Dec	Oral	Dysuria (U)	10	
						Wp	Dec	Oral	Jaundice (D)	10	
						Wp	Dec, Bat	Oral	Urinary tract infection (U)	5	
						Wp	Dec, Ins	Ora	Renal disease (U)	5	
						Wp	Dec, Ins	Oral	Asthma (R)	1	
						Wp	Dec, Ins	Oral	Cough (R)	1	
74	Fabaceae	<i>Bauhinia acuminata</i> L. (LC)	Swe-taw-phyu (B)	စွယ်တော်ဖြူ	Sh	L	Dec	Oral	Malaria (A)	1	EB 180473
75	Fabaceae	<i>Bauhinia purpurea</i> L. (LC)	Swe-taw-ni (B)	စွယ်တော်နီ	T	Wp	Dec	Oral	Diabetic (T)	2	EB 180402

						Wp	Dec	Oral	Analgesic (A)	1	
						Wp	Dec	Oral	Diarrhoea (D)	1	
						Wp	Dec	Oral	Rheumatism (R)	1	
76	Fabaceae	<i>Cassia fistula</i> L.	Ngu-shwewar (B)	ငုရွှေဝါ	T	Rt, Fr	Dec	Oral	Constipation (D)	2	EB 180374
						Rt, Fr	Jui	Top	Pruritus (S)	2	
						Rt, Fr	Dec	Oral	Flatulence (D)	1	
						Rt, Fr	Dec	Oral	Hypertesion (K)	1	
77	Fabaceae	<i>Clitoria australis</i> Benth.	Aung-mae-phyu (B)	အောင်မဲဖြူ	V	Fl	Dec, Ins	Oral	Longevity (A)	1	EB 180472
						Fl	Dec, Ins	Oral	Eye disease (F)	1	
						Fl	Dec, Ins	Oral	Diabetic (T)	1	
78	Fabaceae	<i>Derris trifoliata</i> Lour.	Mi-chaung-nwe (B)	မိကျောင်းနွယ်	V	B	Dec	Oral	Cancer (B)	1	EB 180603
						B	Dec	Oral	Blood tonic (T)	1	
79	Fabaceae	<i>Flemingia paniculata</i> Wall. ex Benth.	Myayar-thone-kwa (B)	မြရာသုံးခွ	Sh	L	Dec, Ins	Oral	Liver disease (D)	2	EB 180407
80	Fabaceae	<i>Leucaena leucocephala</i> (Lam.) de Wit	Baw-za-gaing (B)	ဘောစကိုင်း	T	L, Fr	Food, Dec	Oral	Antithelminthi c (D)	3	EB 180572
81	Fabaceae	<i>Mimosa pudica</i> L.	Hti-ka-yone (B), Hta muck (M)	ထိကရုန်း	H	Wp	Dec, Ins, Food	Oral	Dysuria (U)	33	EB 180415
						Wp	Dec	Oral	Urinary tract	6	

									infection (U)		
						Wp	Dec, Ins, Food, Jui	Oral, Top	Jaundice (D)	4	
						Wp	Dec	Oral	Cough (R)	4	
						Wp	Jui	Top	Cuts and wounds (S)	4	
						Wp	Dec	Oral	Edema (U)	2	
						Wp	Dec	Oral	Fever (A)	1	
						Wp	Dec	Oral	Ulcer (S)	1	
82	Fabaceae	<i>Senegalia rugata</i> (Lam.) Britton & Rose	Kinmum- gyin (B), Hla pruck kha (M)	ကင်ပွန်းချဉ်	V	L, Wp	Dec, Food	Oral	Asthma (R)	6	EB 180417
						L, Wp	Dec, Food	Oral	Cough (R)	6	
83	Fabaceae	<i>Senna alata</i> (L.) Roxb.	Pwe-gaing- mezali (B), Bee takhut baitung (M)	ပွေးကိုင်း မယ်ဇေလီ	T	L, Fl	Ins, Dec, Food, Jui, Pow	Oral	Constipation (D)	30	EB 180390
						L, Fl, Fr	Ins, Dec, Food, Jui	Oral, Top	Diarrhoea (D)	1	
						L, Fl	Ins, Dec	Oral	Dyspepsia (D)	2	
						L, Fl	Ins, Dec	Oral	Flatulence (D)	2	
						L, Fl	Dec, Food	Oral	Haemorrhoid (K)	1	
						L	Jui	Top	Ulcer (S)	1	
						L	Jui	Top	Skin disease (S)	2	
84	Fabaceae	<i>Senna sulfurea</i> (DC.	Pyi-pan- nyo (B),	ပြည်ပန်းညို	T	L	Dec, Food	Oral	Flatulence (D)	1	EB 180525

85	Fabaceae	ex Collad.) H.S.Irwin & Barneby	Yong (M)	ဒန့်ကျဲ	Sh	L	Dec, Food	Oral	Tonic (T)	1	EB 180481
		<i>Senna tora</i> (L.) Roxb.	Dan-gywe (B), Grin Baipai (M) Pauk-pan- phyu (B), Pacow								
86	Fabaceae	<i>Sesbania grandiflora</i> (L.) Poir.	lamsout baikit (M)	ပေါက်ပန်းဖြူ	T	B	Jui	Top	Gum inflammation (D)	2	EB 180542
									Hypertesion (K)	2	
									Constipation (D)	1	
									Dysuria (U)	2	
87	Fabaceae	<i>Tadehagi triquetrum</i> (L.) H.Ohashi	Lauk-thay (B)	လောက်သေ	Sh	Wp	Ins	Oral	Haematemesis (D)	1	EB 180383
						L	Ins	Oral	Tuberculosis (A)	7	
						L	Ins	Oral	Hepatitis B virus (D)	1	
						L	Ins	Oral	Hepatitis C virus (D)	1	
						Wp	Dec	Oral	Asthma (R)	3	
						L	Dec, Jui	Oral	Cough (R)	24	
						L	Ins	Oral	Weight loss (T)	1	
						L	Ins	Oral	Dysuria (U)	1	
						L, Wp	Ins	Oral	Renal disease (U)	11	
						L	Ins	Oral	Urinary tract	1	

									infection (U)		
88	Fabaceae	<i>Tamarindus indica</i> L.	Magyi (B), Sot menglon (M)	မန်ကျည်း	T	B	Jui	Top	Skin disease (S)	1	EB 180484
89	Fabaceae	<i>Vachellia farnesiana</i> (L.) Wight & Arn.	Nan-lon- kyaing (B)	နန်းလုံးကြိုင်	Sh	Rt	Dec	Oral	Antidote (A)	2	EB 180465
90	Gentianaceae	<i>Phyllocyclus lucidissimus</i> (H.Lév. & Vaniot) Thiv	Taung-kyā (B)	တောင်ကြာ	V	Wp	Dec	Oral	Renal disease (U)	1	EB 180444
91	Iridaceae	<i>Eleutherine bulbosa</i> (Mill.) Urb.	Gamon-ni (B)	ဂမုန်းနီ	H	Tu	Pow	Oral	Blood tonic (T)	1	EB 180480
92	Lamiaceae	<i>Clerodendrum</i> sp.	Kya- manaing (B)	ကျားမနိုင်	T	L	Jui	Top	Jointache (L)	1	EB 180565
93	Lamiaceae	<i>Clerodendrum indicum</i> (L.) Kuntze	Nga-yan- padu (B)	ငရံပတူ	Sh	L	Dec, Food	Oral	Rheumatism (R)	1	
						L	Dec, Food	Oral	Diabetic (T)	4	EB 180381
						Rt	Jui	Top	Cholera (D)	2	
						L	Dec, Food	Oral	Edema (U)	1	
									Adominal pain (D)	1	
94	Lamiaceae	<i>Leucas cephalotes</i> (Roth) Spreng.	Pingu- hteik-peik (B)	ပင့်ကူထိတ်ပိတ်	Sh	Wp	Dec	Oral, Bat	Fever (A)	1	EB 180416
						Wp	Jui	Oral, Eye	Eye disease (F)	1	

95	Lamiaceae	<i>Ocimum americanum</i> L.	Pin-sein (B)	ပင်စိမ်း	H	Rt, L	Dec, Food	Oral	Cough (R)	4	EB 180469
						Rt	Dec	Oral	Fever (A)	1	
96	Lamiaceae	<i>Orthosiphon aristatus</i> (Blume) Miq.	Thagya-mageik (B)	သကြားမကိုဋ်	Sh	Wp, L	Dec, Ins	Oral	Diabetic (T)	9	EB 180355
						Wp	Dec	Oral	Dysuria (U)	1	
97	Lamiaceae	<i>Premna</i> sp.	Say-min-yarzar (B)	ဆေးမင်းရာဇာ	Sh	L	Ins	Oral	Dysuria (U)	1	EB 180513
98	Lamiaceae	<i>Prunella</i> sp.	Taw-let-phet (B)	တောလက်ဖက်	Sh	Wp	Dec	Oral	Urinary tract infection (U)	1	EB 180406
99	Lamiaceae	<i>Rotheca serrata</i> (L.) Steane & Mabb.	Yin-bya (B)	ယင်းပြား	Sh	L	Dec, Ins	Bat, Oral	Analgesic (A)	1	EB 180521
100	Lamiaceae	<i>Vitex trifolia</i> L.	Kyaung-ban-lay (B)	ကြောင်ပန်းလေး	Sh	B	Dec	Oral	Fever (A)	1	EB 180394
						L, Wp	Dec	Oral	Adominal pain (D)	2	
						L	Dec	Oral	Paralysis (N)	2	
						L	Dec, Food	Oral	Asthma (R)	1	
						L	Dec, Food	Oral	Cough (R)	1	
101	Lauraceae	<i>Cinnamomum bejolghota</i> (Buch.-Ham.) Sweet	Na-lin-kyaw (B)	နလင်ကျော်	T	Rt	Jui	Top	Mouth ulcer (D)	1	EB 180508
						Rt	Dec	Oral	Dysentery (D)	1	
						Rt	Dec, Jui	Oral	Rheumatism (R)	1	
						Rt	Jui	Oral	Ulcer (S)	1	
102	Lauraceae	<i>Litsea</i> sp.	Ohn-don (B)	အုံတုံ	T	B	Jui	Top	Ulcer (S)	2	EB 180581

103	Loranthaceae	<i>Loranthus</i> sp.	Kyi-baung (B)	ကျီးပေါင်း	Sh	Wp	Jui	Top	Bone fracture (L)	1	EB 180363
						Wp	Jui	Top	Jointache (L)	1	
104	Lythraceae	<i>Lagerstroemia floribunda</i> Jack	Pyin-ma-phyu (B)	ပျဉ်းမဖြူ	T	Rt	Ric, Jui	Oral	Cancer (B)	2	EB 180609
						Rt	Jui	Top	Acne (S)	1	
						Rt	Jui	Top	Herpes (S)	1	
105	Malvaceae	<i>Abroma augusta</i> (L.) L.f.	Pyin-sa-pattar (B)	ပဉ္စပတ္တာ	H	Wp	Pow	Top	Bone fracture (L)	1	EB 180518
						Wp	Pow	Top	Jointache (L)	1	
						Wp	Pow	Top	Low back pain (L)	1	
106	Malvaceae	<i>Hibiscus rosa-sinensis</i> L.	Khaung-yan (B)	ခေါင်ရမ်း	Sh	Fl	Dec	Oral	Fever (A)	1	EB 180470
						Fl	Dec	Oral	Cough (R)	1	
						Fl	Jui	Top	Scar (S)	1	
107	Malvaceae	<i>Sida acuta</i> Burm.f.	Wetchi-ma-nae (B)	ဝက်ချေးမနဲ့	H	Rt, Wp	Dec	Oral	Hepatitis B virus (D)	1	EB 180408
						Rt, Wp	Dec	Oral	Hepatitis C virus (D)	1	
108	Malvaceae	<i>Urena lobata</i> L.	Kat-sae-nae (B)	ကပ်စေးနဲ့	Sh	Wp	Dec	Oral	Diabetic (T)	1	EB 180483
109	Marattiaceae	<i>Angiopteris</i> sp.	Say-myin-khwa-ni (B)	ဆေးမြင်းခွာနီ	Sh	Rt	Hon, Dec	Oral	Longevity (A)	1	EB 180561
110	Melastomataceae	<i>Melastoma malabathricum</i> L.	Say-o-pote (B)	ဆေးအိုပုတ်	Sh	Wp	Dec	Oral	Cancer (B)	7	EB 180400
						Wp	Dec	Oral, Bat	Malaena stool (U)	1	
						Rt	Dec	Oral	Cholera (D)	1	

						L, Wp	Dec, Hon	Oral	Gastric cancer (D)	2	
						Wp	Dec	Oral	Hepatitis B virus (D)	1	
						B	Dec	Mou	Toothache (D)	1	
						Wp	Dec	Oral	Tongue cancer (D)	2	
						Wp	Dec	Oral	Heart disease (K)	1	
						Wp	Dec	Oral	Heart attack (K)	1	
						Wp	Dec, Ins	Oral	Asthma (R)	1	
						Wp	Dec, Ins	Oral	Cough (R)	1	
						L	Dec	Oral	Edema (U)	1	
						L	Dec	Oral	Urinary tract infection (U)	1	
111	Meliaceae	<i>Azadirachta indica</i> A.Juss.	Ta-mar (B)	တမာ	T	L	Pow	Oral	Malaria (A)	1	EB 180534
						L	Dec	Mou	Toothache (D)	3	
						L	Dec	Bat	Pruritus (S)	6	
						L	Dec, Roa, Food	Oral	Diabetic (T)	2	
112	Meliaceae	<i>Sandoricum koetjape</i> (Burm.f.) Merr.	Thit-to (B), Sot Taw (M)	သစ်တို့	T	B	Dec, Ins	Oral	Adominal pain (D)	1	EB 180519
						B	Dec, Ins	Oral	Hypertesion (K)	1	
113	Menispermaceae	<i>Cissampelos pareira</i> L.	Ti-lin-kathar (B)	တိလင်္ကာသ	V	Rt	Jui	Top, Bat	Fever (A)	1	EB 180600
114	Menispermaceae	<i>Tinospora sinensis</i> (Lour.) Merr.	Sin-don-manwe (B)	ဆင်တုံးမနွယ်	V	St, Rt	Pow, Hon	Oral	Longevity (A)	7	EB 180426

115	Molluginaceae	<i>Glinus oppositifolius</i> (L.) Aug.DC.	Gangala (B)	ကန့်ကလာ	H	St	Pow, Hon	Oral, Top	Malaria (A)	1	EB 180564
						St	Dec, Pow, Hon	Oral	Adominal pain (D)	1	
						St	Pow, Hon	Oral, Top	Dyspepsia (D)	9	
						St, Rt	Pow	Oral	Flatulence (D)	8	
						St	Dec	Oral	Liver disease (D)	1	
						St	Dec	Oral	Gastritis (D)	1	
						St	Dec	Oral	Eye disease (F)	1	
						St	Pow, Hon	Oral	Hypertesion (K)	15	
						St	Pow	Top	Bone fracture (L)	2	
						St	Pow	Top	Jointache (L)	2	
						St	Dec, Syr	Oral	Paralysis (N)	4	
						St	Pow, Hon	Oral	Cough (R)	1	
						St, Rt	Pow, Pas, Hon, Syr	Oral	Diabetic (T)	23	
						St	Pow, Hon	Oral, Top	Tonic (T)	11	
						Wp	Food	Oral	Constipation (D)	1	
						L	Dec, Ins	Oral	Dyspepsia (D)	2	
						L	Food	Oral	Flatulence (D)	4	
						L	Food	Oral	Gastritis (D)	5	
						Wp	Dec, Food	Oral	Diabetic (T)	1	

						L	Food, Ins	Oral	Dysuria (U)	1	
116	Moraceae	<i>Ficus auriculata</i> Lour.	Sin-tha-phan (B)	ဆင်သဖန်း	T	Fr, Lat	Jui, Food	Top, Oral	Antidote (A)	1	EB 180530
117	Moraceae	<i>Ficus hispida</i> L. f.	Kha-aung (B)	ခအောင်း	T	Fr, Lat	Jui, Food	Top, Oral	Antidote (A)	1	EB 180425
118	Moraceae	<i>Ficus racemosa</i> L.	Yae-tha-phan (B)	ရေသဖန်း	T	Lat	Jui	Top	Antidote (A)	1	EB 180437
119	Moraceae	<i>Streblus asper</i> Lour.	Okhne (B)	အုံနဲ	T	Rt	Pow, Hon	Oral	Longevity	1	EB 180516
						B	Dec, Hon	Oral	Heart disease	1	
						B	Dec, Hon	Oral	Heart attack	1	
120	Moringaceae	<i>Moringa oleifera</i> Lam.	Dan-dalun (B)	ဒန့်ဒလွန်	T	L, Se, Fr	Food	Oral, eye	Hypertesion (K)	31	EB 180479
						L	Food	Oral, Eye	Eye disease (F)	3	
121	Myristicaceae	<i>Myristica fragrans</i> Houtt.	Zadeik-po (B), Sot jai diphaw (M)	ဇာတိပွဲလ်	T	R Fr	Food	Oral	Constipation (D)	3	EB 180359
						Fr	Food	Oral	Dyspepsia (D)	3	
						Fr	Food	Oral	Flatulence (D)	2	
122	Myrtaceae	<i>Psidium guajava</i> L.	Malaka (B), Sot lincar (M)	မာလကာ	T	L	Jui	Nas	Dizziness (N)	4	EB 180457/544
						L	Jui	Top, Nas	Headache (N)	2	
123	Myrtaceae	<i>Syzygium</i> sp.	Thabyae (B)	သပြေ	T	B	Jui	Mou	Toothache (D)	2	EB 180461
						B	Dec	Oral	Hypertesion (K)	1	
						B	Jui	Top	Scar (S)	1	

124	Onagraceae	<i>Ludwigia octovalvis</i> (Jacq.) P.H.Raven	Taw-lay-nyin/ Maelay (B)	တောလေးညှင်း၊ မြေလေး	H	Wp	Dec	Oral	Abdominal pain (D)	1	EB 180362
						Wp	Dec	Oral	Dyspepsia (D)	1	
						Wp	Dec	Oral	Asthma (R)	2	
						Wp	Dec, Ins	Oral	Cough (R)	1	
						Wp	Dec, Ins	Oral	Lung cancer (R)	1	
						Wp	Dec	Oral	Cuts and wounds (S)	1	
125	Oxalidaceae	<i>Averrhoa carambola</i> L.	Zaung-hlathee (B), Sot paun kywain (M)	စောင်းလျား	T	R Fr	Syr	Oral	Dyspepsia (D)	1	EB 180566
						R Fr	Syr	Oral	Cough (R)	1	
						Fr	Food	Oral	Intrahepatic stone (U)	1	
						Fr	Food, Pas	Oral	Gall stone (U)	3	
126	Oxalidaceae	<i>Biophytum sensitivum</i> (L.) DC.	Hti-saung/Tabi n-shwehti (B)	ထီးဆောင်းပင်၊ တပင်ရွှေထီး	H	Wp	Dec, Ins	Oral	Dysuria (U)	4	EB 180475/ 592
						Wp	Dec, Ins	Oral	Gall stone (U)	3	
						Wp	Dec, Ins	Oral	Urinary tract infection (U)	2	
127	Pandaceae	<i>Pandanus</i> sp.	Kyauk-kwe (B)	ကျောက်ကွဲ	H	Wp, L	Dec	Oral	Renal disease (U)	1	EB 180352
						Wp, L	Dec	Oral	Gall stone (U)	2	
128	Phyllanthaceae	<i>Phyllanthus emblica</i> L.	Zee-phyu (B), Sot talwe (M)	ဆီးဖြူ	T	Fr	Food	Oral	Constipation (D)	1	EB 180413

129	Phyllanthaceae	<i>Phyllanthus niruri</i> L.	Myae-zee-phyu (B)	မြေဆီးဖြူ	H	Fr	Food	Oral	Cough (R)	3	EB 180372
						Fr, L	Dec, Ins	Oral	Diabetic (T)	3	
						Fr	Pow	Oral	Menstrual disorder (X)	2	
						Wp	De, Ins	Oral	Hepatitis (D)	3	
						Wp	De, Ins	Oral	Jaundice (D)	6	
						Wp	De, Ins	Oral	Liver disease (D)	2	
						Wp	De, Ins	Oral	Diabetic (T)	1	
						Wp	De, Ins	Oral	Dysuria (U)	2	
						Wp	De, Ins	Oral	Gall stone (U)	1	
						Wp	De, Ins	Oral	Urinary tract infection (U)	1	
130	Piperaceae	<i>Peperomia pellucida</i> (L.) Kunth	Kyauk-thin-pone (B)	ကျောက်သင်ပုန်း	H	Wp	Dec	Oral	Intrahepatic stone (U)	1	EB 180385
							Dec	Oral	Urinary tract infection (U)	1	
131	Piperaceae	<i>Piper longum</i> L.	Peik-chin (B)	ပိတ်ချင်း	V	Wp	Dec	Oral	Fever (A)	3	EB 180438/ 527
						Wp, Fr	Pow	Oral	Malaria (A)	2	
132	Piperaceae	<i>Piper nigrum</i> L.	Nga-yok-kaung (B)	ငရုတ်ကောင်း	V	Se	Pow, Food	Oral	Fever (A)	1	EB 180361
						Se	Pow, Food	Oral	Malaria (A)	2	
						Se	Pow	Top	Toothache (D)	2	
133	Plumbaginaceae	<i>Plumbago indica</i> L.	Kant-choke-ni (B)	ကန့်ချုပ်နီ	Sh	Wp	Pow	Oral	Tonic (T)	1	EB 180467
						Rt	Pow	Oral	Paralysis (N)	1	
134	Plumbaginaceae	<i>Plumbago</i>	Kant-	ကန့်ချုပ်ဖြူ	Sh	Rt	Pow	Oral	Paralysis (N)	1	EB

	e	<i>zeylanica</i> L.	choke-phyu (B)								180360
135	Poaceae	<i>Cymbopogon citratus</i> (DC.) Stapf	Sabalin (B), Wine baing (M)	စပါးလင်	H	Wp	Jui	Top	Bone fracture (L)	2	EB 180533
						Wp	Jui	Top	Bone fracture (L)	2	
136	Polygonaceae	<i>Persicaria chinensis</i> (L.) H.Gross	Mahagar-kyan-sit (B)	မဟာကာကြံဆစ်	H	L	Food	Oral	Antidote (A)	2	EB 180371
						L	Food	Oral	Hypertesion (K)	1	
						L	Jui	Top	Skin disease (S)	1	
						Wp	Dec, Ins	Oral	Blood tonic (T)	4	
						L	Dec	Oral	Diabetic (T)	1	
137	Rhamnaceae	<i>Ziziphus jujuba</i> Mill.	Zi (B), Sot baidoe sanut (M)	ဇီး	T	Fr	Food	Oral	Constipation (D)	1	EB 180427
						Fr	Food	Oral	Liver disease (D)	1	
138	Rubiaceae	<i>Gardenia</i> sp.	Twin-nat-kadao (B)	တွင်းနက်ကတိုး	H	Fl	Pow	Oral	Blood tonic (T)	1	EB 180505
139	Rubiaceae	<i>Mitragyna parvifolia</i> (Roxb.) Korth.	Htain (B)	ထိန်	T	Fl	Pow	Oral	Blood tonic (T)	2	EB 180442
140	Rubiaceae	<i>Morinda citrifolia</i> L.	Yae-yo (B)	ရဲယို	Sh	L, Fr	Dec, Ins	Oral	Blood circulation (A)	5	EB 180411
						L, Fr	Dec, Pas	Oral	Tuberculosis (A)	1	
						L, Fr	Dec, Pas	Oral	Cancer (B)	1	
						R Fr, Fr	Food	Oral	Dyspepsia (D)	2	

141	Rubiaceae	<i>Neolamarcki a cadamba</i> (Roxb.) Bossner	Ma-u (B)	မအူ	T	L	Jui	Top	Knee pain (L)	4	EB 180353
						L	Syr, Jui, Food	Oral, Top	Rheumatism (L)	1	
						L, Fr	Food, Pas	Oral	Cough (R)	4	
						Fr	Food	Oral	Diabetic (T)	3	
						Wp	Dec	Oral	Antidote (A)	1	
						Wp	Dec	Oral	Tonic (T)	1	
						Wp	Dec	Oral	Urinary tract infection (U)	1	
142	Rutaceae	<i>Aegle marmelos</i> (L.) Corrêa	O-shit (B)	ဥသျှစ်	T	Fr c	Jui	Oral	Diarrhoea (D)	2	EB 180384
						Fr c	Jui	Oral	Dysentery (D)	2	
143	Rutaceae	<i>Citrus limon</i> (L.) Osbeck	Than-bayar (B)	သံပုရာ	T	Fr, Se	Food	Nas	Hypertesion (K)	5	EB 180429
						Fr	Food, Syr	Nas	Dizziness (N)	1	
						Fr	Food, Syr	Nas	Headache (N)	1	
						Fr	Food	Oral	Cough (R)	1	
144	Rutaceae	<i>Murraya koenigii</i> (L.) Spreng.	Pyin-daw- hein (B)	ပျဉ်းတော်သိမ်	Sh	B	Food	Oral	Internal organ cancer (B)	3	EB 180396
						L	Dec, Food	Oral	Diabetic (T)	1	
145	Santalaceae	<i>Santalum album</i> L.	Nan-tha- phu (B)	နံ့သာဖြူ	T	B	Jui	Top	Analgesic (A)	1	EB 180391
						B	Jui	Top	Skin disease (S)	2	
146	Sapotaceae	<i>Mimusops elengi</i> L.	Kha-yae (B)	ခရေ	T	L	Dec	Oral	Diabetic (T)	10	EB 180563

147	Solanaceae	(LC) <i>Physalis angulata</i> L.	Bauk-pin (B)	ဗေါက်ပင်	H	Wp	Dec	Oral	Jaundice (D)	2	EB 180560
148	Talinaceae	<i>Talinum fruticosum</i> (L.) Juss.	Kaw-li-thain (B)	ကောလိသိမ်	H	Rt	Dec, Ins	Oral	Longevity (A)	2	EB 180418
						Rt	Dec, Ins	Oral	Gastritis (D)	1	
						Rt	Dec, Ins	Oral	Diabetic (T)	1	
						Rt	Dec, Ins	Oral	Tonic (T)	2	
149	Verbenaceae	<i>Lippia alba</i> (Mill.) N.E.Br. ex Britton & P.Wilson	Kalar-pin-sein (B)	ကုလားပင်စိမ်း	H	L	Dec	Oral	Fever (A)	1	EB 180392
						L	Dec	Oral	Cough (R)	1	
150	Verbenaceae	<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Aseik-pyay (B)	အဆိပ်ဖြေ	H	L	Roa, Jui	Top	Antidote (A)	2	EB 180486
						L	Roa, Jui	Top	Ulcer (S)	4	
151	Vitaceae	<i>Vitis</i> sp.	Wa-wound-chin (B) , La aw (M)	ဝရောင်းချဉ်	V	L	Food	Oral	Jaundice (D)	2	EB 180532
						L	Food	Oral	Renal disease (U)	1	
						Fr	Food	Oral	Gall stone (U)	2	
152	Zingiberaceae	<i>Boesenbergia</i> sp.	Taw-gamon (B)	တောဂမုန်း	H	Rh	Pow	Oral	Menstrual disorder (X)	1	EB 180577
153	Zingiberaceae	<i>Curcuma longa</i> L.	Na-nwin (B), Meet (M)	နန္ဒင်း	H	Rh	Pow	Top	Abdominal pain (D)	1	EB 180520/ 589
						Rh	Pow	Oral	Diarrhoea (D)	1	
						Rh	Pow	Oral	Dyspepsia (D)	1	
						Rh	Pow	Oral	Gastritis (D)	1	

154	Zingiberaceae	<i>Kaempferia galanga</i> L.	Kunsar-gamon (B)	ကွမ်းစားဂမုန်း	H	Rh	Food	Oral	Flatulence (D)	1	EB 180449
						Rh	Jui, Food	Oral	Vomiting (D)	1	
155	Zingiberaceae	<i>Kaempferia parviflora</i> Wall. ex Baker	Nanwin-nat (B)	နနွင်းနက်	H	Rh	Dec	Oral	Longevity (A)	1	EB 180594
							Dec	Oral	Cancer (B)	1	
156	Zingiberaceae	<i>Zingiber barbatum</i> Wall.	Meik-thalin (B)	မိတ်သလင်	H	Rh, Wp	Jui	Top	Bone fracture (L)	17	EB 180354/ 439
						Rh	Jui	Top	Jointache (L)	2	
157	Zingiberaceae	<i>Zingiber officinale</i> Roscoe	Gyin (B), Lacow sacopf (M)	ဂျင်း	H	Rh	Dec, Food	Oral	Reduce body heat (A)	1	EB 180434/ 582
						Rh	Ins, Jui	Bat, Top	Internal pain (A)	1	
						Rh	Food	Oral	Dyspepsia (D)	2	
						Rh	Dec	Oral	Flatulence (D)	1	
						Rh	Jui	Top	Jointache (L)	2	
						Rh	Dec	Oral	Menstrual disorder (X)	1	
158	Zingiberaceae	<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm. (DD)	Linne-gyi (B)	လင်းနေကြီး	H	Rh	Dec	Oral	Diarrhoea (D)	1	EB 180611
						Rh	Dec	Oral	Dyspepsia (D)	1	

Note:

Species with bold letters are new records of medicinal plants in Myanmar.

Conservation Status- (LC- Least Concern), (DD-Data Deficient)

Origin of plant - (N-Native; I-Introduced), Life form- (T-Tree; H-Herb; Sh-Shrub; V-Vine)

Life form - (H-Herb; T-Tree, Sh-Shrub; V-Vine)

Plant parts used - (Wp- Whole plant; L-Leave; Rt-Root; St-Stem; Se-Seed; Rh-Rhizome; Fl-Flower; Tu-Tuber; Fr-Fruit; R Fr- Ripe fruit; Lat-Latex; Fr c- Fruit cover; Po-pollen)

Vernacular name (B-Burmese name; M-Mon name)

Preparation method- (Dec-Decoction; Ins-Instant teas; Pow-Powder; Jui-Juice; Pas-Processing with palm sugar; Roa-Roast; Hon-Processing with honey; Syr-Syrup; Ric-Processing with rice water)

Administration method- (Ora-Oral; Mou-Mouthwash; Top-Topical; Nas-Nasal; Eye-Eye-drop; Ear-Ear-drop; Bath-Bathing)

URs - Use reports