Leaftlet No. 6/1997

Government of the Union of Manmar
Ministry of Forestry
Forest Department

Plant Biodiversity of Mount Popa
(Part I)

Daw Yin Yin Kyi, Assistant Director
and
U Aung Zaw Moe, Research Assistant
Forest Research Institute, Yezin.
August 1997

Acknowledgements

The authors wish to express their thank to Dr. Tin Myint (Retired Professor, Department of Botany Yangon University) for rendering valuable advice and suggestion. We would also thank U Saw Kelvin Keh (Pro - Rector of the Institute of Forestry) for undertaking the task of proof reading and correction on it. Thanks are also due to U Shwe Kyaw, Director of Forestry Research Institute for funding, which enable us to do this research project. Due thanks are also due to the Director of Mandalay Forest Division, U Tun Tun and also the Assistant Director of Myingyan District and Township officer of Kyaukpadaung Township for providing facilities in our research work in Popa as base camp. And finally we would heartily thank U Uga, Director of Nature and Wildlife conservation Division and also to U Sae, Park warden and all the staffs from Popa Mountain Park.

ပုပ္ပါးတောင်တွင် ပေါက်ရောက်သော သဘာဝပေါက် အပင်များနှင့် မျိုးစိတ်တစ်ခုစီ၏ ပေါက်ရောက်မှု အခြေအနေကို လေ့လာခြင်း။

ဒေါ်ရင်ရင်ကြည်၊ B.Sc. (Bot.) (Rgn.)၊ လက်ထောက်ညွှန်ကြားရေးမှူး
နှင့်
ဦးအောင်ဇော်မိုး၊ B.Sc. (Bot.) (Mdy.)၊ သုတေသနလက်ထောက်၊
သစ်တောသုတေသနဌာန၊ ရေဆင်း။

စာတမ်းအကျဉ်းချုပ်

မြန်မာပြည် အလယ်ပိုင်းရှိ အပူပိုင်း မြေပြန့်လွင်ပြင် အတွင်း၌ မြင့်မားစွာ တည်ရှိနေသော ပုပ္ပါးတောင်သည် ပတ်ဝန်းကျင် မြေပြန့်လွင်ပြင်တွင် ရှိသော အပင်ပေါက်ရောက်မှု များနှင့်မတူ၊ တမူ ထူးခြား လျှက်ရှိပြီး အစဉ်စိမ်းလန်း စိုပြေနေသည့် အတွက် ပုပ္ပါးတောင် ဥယျာဉ်အတွင်း သဘာဝ အလျောက် ပေါက်ရောက် ရှင်သန်နေကြသော အပင်မျိုးစိတ်များအား ပြည့်စုံစွာ ကောက်ယူ စစ်တမ်းပြု မှတ်သားထားခြင်း အားဖြင့် မျိုးစိတ်တစ်ခုစီ၏ အခြေအနေကို သိရှိနိုင်ရန်နှင့် အပင်များ ပေါက်ရောက်ပုံ အခြေအနေများကို လေ့လာတင်ပြထားသော စာတမ်းဖြစ်ပါသည်။

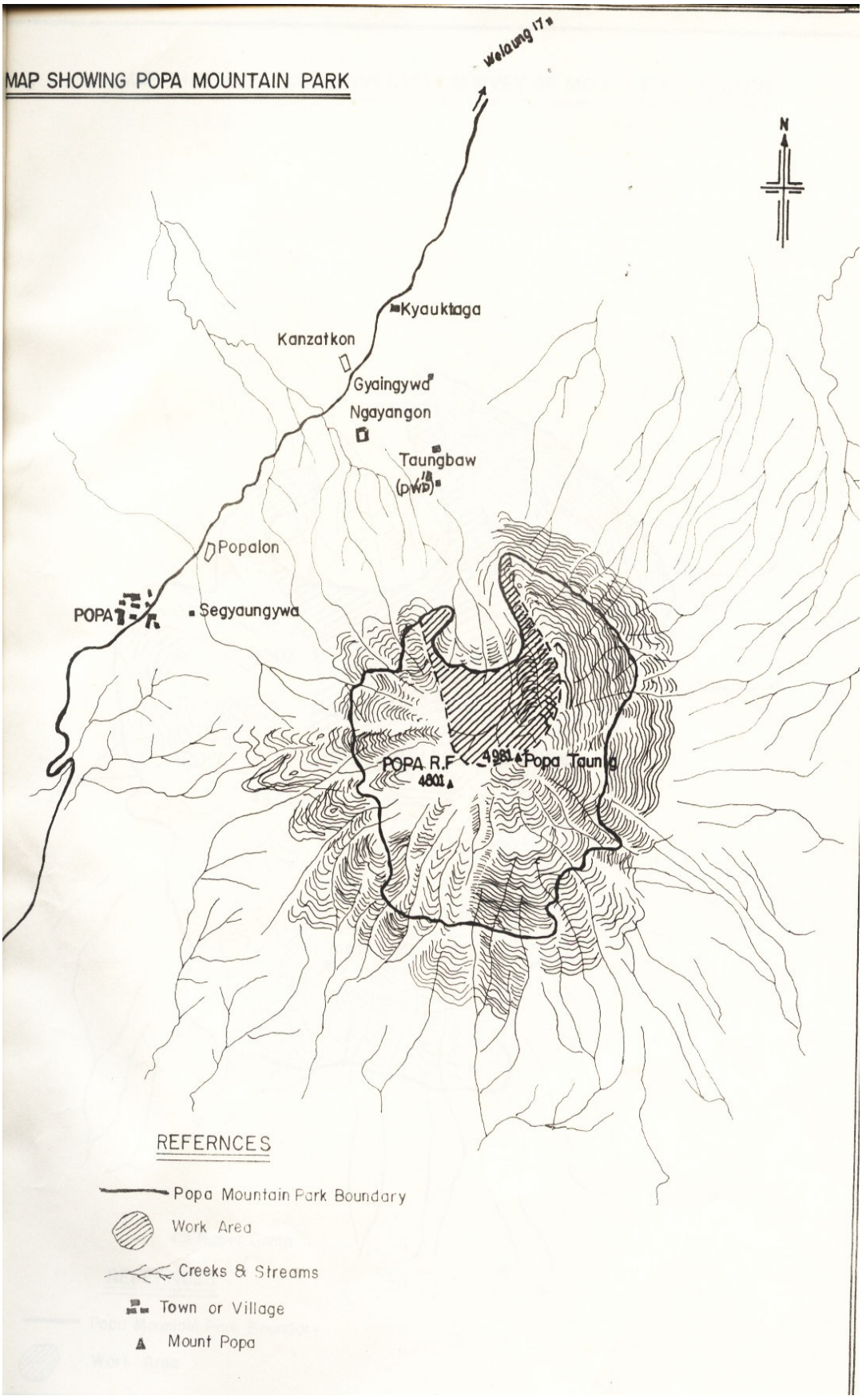
Plant Biodiversity of Mount Popa (Part I)

Daw Yin Yin Kyi, B.Sc. (Bot.) (Rgn.), Assistant Ditrector
and
U Aung Zaw Moe, B.Sc. (Bot.)(Mdy.), Research Assistant,
Forest Research Institute, Yezin.

Abstracts

Mount Popa is the only prominent volcano, which became extinct some thousands of years ago. It is situated in the plain of dry zone, in central Myanmar, it is one of the very few prominent landmarks in the area. Eventhough it is situated in the dry zone area, Mount Popa itself exhibits not only the dry forest type species but also other differing forest type species, including the evergreen species and grasslands. This paper attempts to present the plant biodiversity and a detailed study of the species which occur in the Mount Popa Crater.

Contents


MAP SHOWING POPA MOUNTAIN PARK
Welaung 17
N
Kyauktaga
Kanzatkon
Gyaingywa
Ngayangon
Taungbaw
(pwd)
Popalon
POPA
Segyaungywa
POPA R.F
4981
Popa Taung
4800
REFERNCES
Popa Mountain Park Boundary
Work Area
Creeks & Streams
Town or Village
Mount Popa

MAP SHOWING PLANT BIODIVERSITY SURVEY OF MOUNT POPA CRATER.

REFERNCES

Popa Mountain Park Boundary.

Work Area

1. Introduction

Mount Popa is about 34 miles South-East of Pagan, an ancient capital of Myanmar on the bank of the Ayeyarwady river, and 10 miles North-East of Kyaukpadaung town of the dry zone area. The Popa volcano, which became extinct some thousands of years ago, stands out as an easily recognizable landmark visible from 50 miles or more. Its precise position is 25° 56' N / by 55° 16' E.

Eventhough it is in the dry zone area, it is almost always evergreen, due to its elevation of 4981 feet above sea level. On it can be found the various Dry Forests such as Than Dahat Forests and Thorns Forests on its lower reaches and the Dry Hill Forests, Dry Upper Mixed Deciduous Forests and Indaing Low Forests on the upper reaches. From there up to the summit, grasslands predominates. Compared to other Forests of the same types, the species composition found in Mount Popa is very luxuriant, particularly herbs, shrubs, climber and also medicinal plants (Yin Yin Kyi, 1992).

According to the ancient legend, the slopes of the hill. were wholly covered with many flowering plants and trees and thus the hill was given the name of " Popa " which in Sanskrit, " Puppha " means " Flower ". Thus, to the early Myanmar, it was recognized as the mountains of flowers.

Mount Popa area, existing in the water-scarce arid zone, where various kinds of flowers and trees grow, is known as an oasis of the arid zone. The water supply of Kyaukpadaung town is supplied by the springs welling up in Mount Popa.

As Mount Popa is very rich in the composition of the flora, a complete floral list of the area is prepared under the supervision of the head of the Forest Botany Section, FRI, Yezin. This work on plant biodiversity of Mount Popa was started as Part I of the research programme which entails a lot of time and energy to complete the flora list. In this paper, some vegetative species in the crater of Mount Popa are presented as is within the capability of the authors.

Further research on the plant biodiversity of Mount Popa will be on going. After all research have been completed, a floral list of the whole Popa Mountain park will be presented as Part II of the research programme.

2. Background

A preliminary survey work on Mount Popa had been done in December 1986 to December 1987. But it was only on the western part of the Mount Popa. The Popa Mountain Park cover an area of 12,154 ha. Survey of the whole area was not complete as it is too large. So this research work of plant biodiversity of Popa Mountain Park is being continued. To have a complete floral list of Mount Popa, more research work have to be continued.

As Mount Popa area abounds with so many luxuriant species of trees, herbs, shrubs, climbers and medicinal plants, the Forest Department had opened up the Popa Mountain Park and the Environmental Education Centre (E.E.C) since 1982. The aim of that centre is to educate the people about the rich environment and the beneficial effect of the plentiful flora that abounds on Mount Popa. So as to know about the rich biodiversity of plants in the Popa Mountain Park much survey works have to be done. In this paper, a detailed study of some of the species found in the crater of Mount Popa is presented. A complete survey of the whole area of the Popa Mountain Park will involve a very long-term research. This survey is only part of Mount Popa area. This paper described the area of Mount Popa Crater which is part

Popa Mountain park. It is also the continuation of the work of the first survey which was done in 1986-87.

3. Methods and Observation

The research work was started in November 1995 to August 1996. Much emphasis was put on collection work of the vegetation which were taken back to F.R.I. Yezin, Herbarium for it identification. Collection was done on a monthly basis headed by myself and a research assistant with the aid of a forester, a forest guard and some daily labourers from Popa village.

Popa Mountain Park was chosen as the main base camp and Taungbaw Ywa was the second base camp. The crater is about one mile wide and from the top of the Mountain it descands downward to a depth of about 2000 feet. The vegetation is very luxuriant and includes trees which attain to a height of 70 to 80 feet. The undergrowth is very moist and dense with herbs, shrubs and climbers. It is evergreen.

To cover the area of the crater, much effort had to be put in to complete the work. Entrance from the Taungbaw Ywa into the crater is made through the valley which is taken as the main path, from which eight compartments are divided. Through the main path, vegetative survey was carried out for the first six compartments. For the remaining two compartments, the survey was conducted from the other way round, starting from Sababon-Taung and slowly descending to the two remaining compartments.

The eastern upper portion of the crater is too steep to be surveyed although it is full of luxuriant vegetative growth including large and tall trees. The species that are collected in this survey may not include some of the species that crop up in the steep slopes.

Survey in the crater were carried out for 10 to 12 days per month. Although collection work had been done, identifications had not been completed as some of the specimens collected had to be sent to the Smithosonian Institution for identification. In some cases, only the description of the species can be made and the specimens numbered but the botanical names have thus to be given yet. Some are still under examination and the floral list can be completed after survey work of the whole area of Popa Mountain Park will have be completed in 1998.

Survey around the crater, just entering the boundary, is about 2000 feet above sea level and around there, tree species and also the same herbs, shrubs can be found as in the western part of the Mount Popa, including thit-ya, ingyin. The area look like the Dry Upper Mixed Deciduous Forest Type species and Low Indaing Forest Type species mixed together in some places. Then, enterance to the inside part, tree species composition changes, Thit-ya and ingyin becoming absent and the Moist Upper Mixed Deciduous Forest type species can be found, such as kyun, pyinkado, didu, nabe, panga and pet-wun.

And from there, going through inside, again it seem turn to Evergreen Forest type because of Evergreen Forest type species, such as kadut, pyinma, shaw, being found and they are mixed together with Moist Upper Mixed Deciduous Forest type species. So it could not be said, that the crater is not the typical Evergreen Forest types. In the inner moist area about 2000-3000 ft., spring water is present creating a cool and damp atmosphere. The tree species growing around that area are rather large and attaining 80-100 feet in height. Zin-byun, pet-hla, ye-padauk, thabye, sintha-pan and taw-thidin are also found.

Within the crater, large trees and a dense undergrowth is present. Walking through the crater, sunlight can not pass through creating a cool atmosphere, just like the air condition room. One species of bamboo, wa-net have been found, just under the Hman-pya-taung area. Wa-net is found growing mixed together with some others large trees. From there, up to the higher reaches the tree become smaller stunted and sparse. Most of the places are covered with only grassland. The common species are thit-ni, sewa-gyi, thit-swele and kadut. As an undergrowth, taung-ne-gya can only be found there during cold season.

Some common herbs, shrubs and climbers are also found in the undergrowth, some species being more frequent than others. As soon as we enter the crater, thekke-myet, wayon-myet, kyetmauk-subyan, taw-kyetmauk-lay, germani-chon, pingu-hteik-peik, payan-nawa, nasha-gyi, wun-u, pauk-new, khwe-le-ya, ngan swe, su-yit, su-gyin, nwe-chin, hnut-cho, eik-thara-muli, min-go-ga are also found abaundantly. In there, at about 2000-3000 feet, medicinal plants such as sayo, peik-chin and some herbs of Zingiberaceae family and ferns are also found. Some Araceae plant can also be found.

During the survey of the crater, medicinal plants such as yinbya, selet-wa, khan-dauk, nalin-kyaw, sewa-gyi, lettok-gyi, eik-thara-muli, sayo, peik-chin, taw shauk, taung-phala, mahaga-kyansit, min-go-ga, payan-nawa, wun-u, myin-gaung, nayaung, pone-mathein, thetyin-gyi and thetyin-kado are also found. Among these medicinal plants, sayo is the most common species and is found everywhere in the crater. Taung-tan-gyi is absent in the crater.

4. Discussion and Conclusion

During this survey work, which is carried out only in the crater part, the following kinds of species have been recorded.

1.	Trees	48 species
2.	Small trees	33 species
3.	Shrubs	47 species
4.	Herbs	44 species
5.	Climbers / Straggling shrubs	28 species
6.	Grasses (excluding Bamboo)	9 species
7.	Sedges	2 species
8.	Bamboo	1 species
9.	Ferns	7 species
10.	Parasitic Plants	2 species
	Total	221 species

Out of 221 species, the identification species list is shown in the appendix. Only 71 families could be identified out of those 221 species. In this plant biodiversity survey, we can only work on the species level. At the species level, it refers not only to the diversity of the total flora, but also to the diversity of families and genera. In this study area of Mount Popa Crater, the family, genera and species are recorded as follows:

Nos of Family	71
Nos of Genus	187
Nos of Species	221

As the result of this plant biodiversity survey work of the Mount Popa Crater, five types of species can be classified.

1. Common Species
2. Frequent Species
3. Occasional Species
4. Rare Species
5. Endanger Species

The 221 species recorded in the present work, could be grouped as;

49 common species
110 Frequent species
43 occasional species
19 rare species and endangered species cannot be designated as yet in the present research work.

Out of 49 common species, some such as pet-sut, taw-thidin, thetyin-gyi, butalet, shone and kadut are common tree species. Among these taw-thidin, pet-sut, and thetyin-gyi are the most common and can be found through out the whole area of the crater. The most common species of medicinal plant is sayo. The common grass species can be said to be wayon-myet.

Out of 110 frequent species, ondon, mayanin, thit-magyi, ngu-shwe, yin-daik, thetyin-kado, ingyin, thit-ya and panga are the tree species found. But only ingyin, thit-ya and panga are only found in the outer portion of the crater. Kyun and sintha-pan are also found as frequent as thit-ya, ingyin. Of the other kinds of frequent species, ferns can be found at damp areas and rocky sites. Among the 110 frequent species, five species are medicinal plants such as min-go-ga, wun-u, eikthara-muli, peik-chin and se-let-wa.

Of the 43 occasional species, bon-meza, pyinkado, palan, swedaw, tha-di, thitkado, pet-hla, yon, te, thit-swele, ohne, bambwe, pyinma and zaung-bale are the only tree species. Only two kinds of medicinal plant can be classified as occasional species, which are sewa-gyi and kasaw. The other occasional species are herbs, shrubs and climbers only.

As for rare species, only one bamboo which is wa-net and one of the palm species, thin-baung can be found. As for the rare tree species yetha-bye, ye-padauk, wa-so, didu, bawdi-nyaung, myauk-ngo and some Glochidion species can be found. Rare species of medicinal plant includes taung-phala, kalamet and khan-dauk only.

Out of these 221 species that are found in the inner crater for community or local use, 71 plants species were found to be of some importance. Of these, 18 were used for medicinal purposes, 10 for fire wood, 12 for construction, 10 provided edible fruits and vegetable and 21 were used for a variety of other purposes. These other purposes include covering granary floor, carrying luggage, agricultural tools, fencing material, babana props and fodder for cattle.

All the facts and findings found in this investigation is presented in this paper. It is presumed that at one time, the species composition may be much more luxurious

than the present finding. It is quite possible that the species composition decreases due to biotic interferences of the environment and the frequent unlimited use of the plants and trees by the rural population around the area. If this process goes on unchecked and unless protection is effectively provided, some of the rare and valuable species including the medicinal plants will gradually become extinct. This research finding points to the fact that there is an urgent need to effectively protect this Mount Popa Area.

Appendix I

List of the Specimens from Mt. Popa Crater

1.	**RANUNCULACEAE**	
	Clematis kerriana Drumm. & Craib	Taw-kwapyu
	Clematis subumbellata Kurz	Taw-kwanyo
	Naravelia laurifolia Wall.	
	Thalictrum foliolosum DC.	Khandauk
2.	**DILLENIACEAE**	
	Dillenia pentagyna Roxb.	Zinbyun
3.	**ANNONACEAE**	
	Miliusa velutina Hook.f. & Thoms	Thabutgyi
4.	**MENISPERMACEAE**	
	Cocculus villosa DC.	Kywet-nabaung
	Cyclea peltata Hook.f. & Thoms.	Gwedauk-hmwesoke
5.	**BERBERRIDACEAE**	
	Berberis asiatica Roxb.	Se-wa-gyi
6.	**FLACOURTIACEAE**	
	Flacourtia cataphracta Rox	Naywe
7.	**PITTOSPORACEAE**	
	Pittosporum nepaulensis (DC.) Rehoto & Wilson	Mayanin
8.	**DIPTEROCARPACEAE**	
	Dipterocarpus tuberculatus Roxb.	In
	Shorea obtusa Wall	Thitya
	Shorea siamensis (Kurz) Miq.	Ingyin
9.	**BOMBACEAE**	
	Salmalia insignis Schott & Endl	Didu
10.	**MALVACEAE**	
	Abutilon indicum (L.) G.Don.	Bauk-kwe
	Hibiscus cancellatus Roxb.	Taw-wa
	Kydia calycina Roxb.	Petwun-ni
	Sida carpinifolia L.	Ketsine
	Sida cardifolia L.	Ketsine
	Urena lobata L.	Wetche-pinne
11.	**STERCULIACEAE**	
	Erythropsis colorata (Roxb.) Burkill	Wet-shaw
	Helicteres elongata Wall.	Tayaw-nyo
	Mansonia gagei J.R. Drum	Kalamet
	Sterculia versicolor Wall	Shaw-pyu

12.	**TILIACEAE**	
	Berrya mollis wall	Petwun-pyu
	Grewia laevigata Vahl	Khwe-tayaw
	Grewia tiliaefolia Vahl	Tayaw
	Triumfetta pilosa Roth.	Kestsine
13.	**ELAEOCARPACEAE**	
	Eleocarpus af. tectorium (Lour) Merr.	Waso
14.	**MALPIGHIACEAE**	
	Hiptage candicans Hook. f.	Zimani
15.	**OXALIDACEAE**	
	Oxalis corniculata L.	Hmo-na-shin
	Oxalis corymbosa DC.	Hmo-na-shin
16.	**RUTACEAE**	
	Aegle marmelos (L.) Correa.	Okshit
	Clausena heptaphylla W. & A.	Taw-Pyindaw-Thein
	Glycosmis pentaphylla (Retz.) Correa	Taw-shauk
	Murrya paniculata W. & A.	Taw-yuzana
	Toddalia aculeata Pers.	Shint-matat
17.	**SIMAROUBACEAE**	
	Horrisonia perforata Merr.	Sugyin
18.	**BURSERACEAE**	
	Garuga pinnata Roxb	Chinyok
	Protium serratum Engler	Thadi
19.	**MELIACEAE**	
	Cedrela toona Roxb.	Thit-kado
	Chukrasia tabularis A. Juss.	Yinma
	Walsura villosa Wall.	Gyo-kamet
20.	**OLACACEAE**	
	Olax scandens Roxb.	Lelu
	Anacolosa af. griffithii Mast.	Taw-thanakha
21.	**CELASTRACEAE**	
	Celastrus paniculatus Willd.	Myin-gaung-nayaung
	Laphopetalum wallichii Kurz	Ye-thabye
22.	**RHAMNACEAE**	
	Ventilago madraspantana Gaertn	
	Zizyphus rugosa Lamk.	Zitalaing
23.	**VITACEAE**	
	Vitis pedata Vahl	Yinma-letsat

24. SAPINDACEAE

Cardiospermum halicacabum L.	Kala-myetsi
Schleichera oleosa (Lour) Merr.	Gyo
Sapindus rarak Blume.	Kala-Kimmum

25. ANACARDIACEAE

Lannea coromandelia (Houtt.) Merr	Nabe
Mangifera spp.	Taw-thayet
Rhus paniculata Wall.	Khaung
Semecarpus spp.	

26. PAPILIONACEAE

Butea superba Roxb.	Pauknwe
Crotalaria alata Buch Ham	Chu-pin
Crotalaria bilata Schr	Chu-pin
Crotalaria sessiliflora L.	
Crotalaria striata DC.	Taw-peiksin
Dalbergia cultrata Grah.	Yin-daik
Delbergia paniculata Roxb.	Ta-bauk
Desmodium gangeticum (L.) DC.	Kye-mepho
Desmodium gyrans DC.	Shinkho-pin
Desmodium latifolium (Roxb.) DC.	Gyoe-pan
Eriosema chinense Vogel.	Taw-peiksan-galay
Flemingia congesta Roxb.	
Millettia extensa Benth.	Wun-u
Millettia pachycarpa Benth.	Myin-gaungnwe
Mucuna prurita Hook.	Khwe-hlay-ya
Indigofera galegoides DC.	Taw-me-yaing
Indigofera lacei Craib	Tame

27. CAESALPINIACEAE

Bauhinia racemosa Lamk.	Palan
Bauhinia velutina Wall.	Swe - daw
Bauhinia diphylla Buch - Ham.	Leikpya - nwe
Caesalpinia cf. enneaphylla	Ngan - swe
Cassia fistula L.	Ngu - shwe
Cassia occidentalis (L.) Britt. & Rose.	Ka - sok
Cassia tora L.	Dang - kywe

28. MIMOSACEAE

Acacia pennata Willd.	Su - yit
Albizzia chinensis (Osbeck) Merr.	Bon - meza
Albizzia odoratissiama Benth.	Thit - magyi
Xylia dolabriformis Benth.	Pyinkado

29. ROSACEAE

Eriobotrya bengalensis Hook.f.	Pet - sut
Rubus Lasiocarpus Smith.	Shan -zi
Rubus ellipticus Smith.	Su - hmwe

30.	**CRASSULACEAE**	
	Kalanchoe laciniata (L.) DC.	Mi - malaung - pan
31.	**COMBRETACEAE**	
	Anogeissus acuminata Wall.	Yon
	Combretum cf. latifolium	Kyet - tet
	Terminalia chebula Retz.	Panga
	Terminalia tomentosa W & A	Taukkyan
32.	**BARRINGTONIACEAE**	
	Careya arborea Roxb.	Bambwe
33.	**LYTHRACEAE**	
	Duabanga grandiflora (Roxb.) Walp.	Myauk ngo
	Lagerstroemia speciosa (L.) Pers.	Pyin - ma
	Lagerstroemia villosa Wall.	Zaungbale
34.	**UMBELLIFERAE**	
	Heracleum candicans Wall.	Taung - phala
35.	**ARALIACEAE**	
	Heteropanax fragrans Seem.	Kyaung - sha - letto
	Schefflera venulosa Harms.	Se - letwa
36.	**RUBLACEAE**	
	Borreria laevis	Joe - chetauk
	Hedyotus spp.	
	Wendlandia glabrata DC.	*Thit - ni*
	Xeromphis dumentrum Lamk.	Hman
37.	**COMPOSITAE**	
	Anaphalis araneosa DC.	Kanbalu
	Artemisia vulgaris L.	Medidote
	Bidens pilosa L.	Tasi - auk
	Blumea balsamifera DC.	Ponma - thein
	Crassocephalum crepidiodes (Benth.) Moore.	
	Eupatorium odoratum L.	Zamani
	Helianthus decapitalis L.	Taung - negya
	Spilanthes filicaulis	Bizut
	Tridax procumbens L.	Tabin - shwe - hti
	Vernonia roxburghii Less.	
	Vernonia volkameriaefolia (Wall.) DC.	Payan - byu
	Ageratum conyziodes L.	Khwe - thay - pan
	Galinsoga parviflora Cav.	Kayinma - paung
	Xanthium strumarium L.	Katsine
	Zinnia elegans L.	Htat - ta - ya
38.	**MYRSINACEAE**	
	Rapanea af. neriifolia (Seib & Zucc) Mez.	Maniawga

39.	**EBENACEAE**	
	Diospyros burmanica Kurz	Te
40.	**OLEACEAE**	
	Chionanthus ramiflora Roxb.	Tawkyet - sa
	Jasminum funale Dence.	Taw - sabe
	Linociera macrophylla wall.	Taw - petsut
41.	**APOCYNACEAE**	
	Aganosma marginata G.Don.	Khaung - tan
	Carissa spinarium A.DC.	Taw - Khan
	Holarrhena antidysenterica wall.	Lettok - gyi
	Parameria barbata K. Schum.	New - chin
	Vallaries solanucea (Roth.) Kuntze.	Nabu - new
42.	**ASCLEPIADACEAE**	
	Calotropis procera R.Br.	Mayo
43.	**PERIPLOCACEAE**	
	Cryptolepis buchanani Roem & Schum.	Nasha - gyi
44.	**BUDDLEIACEAE**	
	Buddleia asiatica Lour.	Pon - ma - chi
45.	**CONVOLVULACEAE**	
	Argyreia barigera Chois.	Min - go - ga
	Argyreia speciosa Swartz	Kanzum - gyi
	I*pomea triloba* L.	Kanzun - nwe
46.	**SOLANACEAE**	
	Physalis minima L.	Bauk - pin
	Solanum indicum L.	Khayan - Kazaw
	Solanum nigrum L.	Bauk-lauk - nyo
	Solanum torvum Swartz	Myobyet - Khayan
47.	**BIGNONIACEAE**	
	Stereospermum Suaveolen DC.	Kywe - magyo - lein
48.	**ACANIHACEAE**	
	Daedulacanthus macrophyllus T. Anders	Yemase
	Judticia spp.	
	Rhinacanthus communis Nees	Htal - labut
49.	**VERBENACEAE**	
	Clerodendrum serratum Spreng	Yin - bya
	Clerodendrum spp.	
	Lantana camara L.	Sein - naban
	Tectona grandis L.f.	Kyun
	Vitex limonifolia wall.	Pet - lezin
	Vitex peduncularis wall.	Pet - lezin

50. LABIATAE

Ajuga macrosperma Wall	
Colebrookia oppositifolia Sm	
Colquhounia coccinea Wall	
Cymaria spp.	
Leucas linifolia Spreng L.	Pinku - htaik - paik

51. AMARANTHACEAE

Achyranthes asper L.	Kyet - mauk - supyan
Altrenanthera sessilis R. Br.	Pazunsa
Celosia urgentea L.	Kyet - mauk - phu
Gomphrenu cilosioides Mart.	Taw - Kyet - mauk - gale

52. POLYGONACEAE

Polygonum chinense L.	Mahaga - Kyansit
Polygonum tomentosum Willd.	Mahaga - Kyansit

53. ARISTOLOCHIACEAE

Aristolochia roxburghiana Klotzsch	Eik - thara - muli

54. PIPERACEAE

Piper attenuatum Ham.	Sayo
Peperomia reflexa A. Diter	

55. LAURACEAE

Cinnamomum spp.	Nalin - Kyaw
Litsaea glutinosa (Lour) C. B. Cl.	Ondon

56. EUPHORBIACEAE

Antidesma diandrum Roth.	Kinbalin
Baliospermum axillare Blume	Hnat - cho
Bischofia javanica Blume	Yepadauk
Bridelia burmanica Hook. f.	Seik - che
Croton joufra Roxb	Thetyin - kado
Croton roxburghianus Bal.	Thetyin - gyi
Emblica officinalis Gaertn.	Zibyu
Euphorbia hirta L.	Kywe - Kyaung -hminsi
Glochidion coronatum Muell. Arg.	Tama - sok
Macaranga indica Wt.	Pethla
Mallotus phillippinensis L.	Taw - thidin
Phyllanthus niruri L.	Taung - zibyu

57. ULMACEAE

Trema tomentosa (Roxb) Hara	Khwe - tayaw
Ulmas lancifolia Roxb.	Shone

58. MORACEAE

Ficus auriculata Lour.	Sin - tha - phan
Ficus hispida L.f.	Kadut
Ficus religiosa L.	Bawdi - nyaung
Streblus asper Lour.	Ohne

59.	**URTICACEAE**	
	Debregeasia longifolia Wedd.	Ye - tha - khwa
	Pouzolzia pentandra Benn.	
	Villebrunea integrifloia Gaud	Oboak
60.	**LORANTHACEAE**	
	Scurrula parasitica L.	Kyi - paung
	Viscum ovalifolium Wall.	Kyi - paung
61.	**JUGLANDACEAE**	
	Engelhardtia spicata Blume	Thit - swele
62.	**ZINGIBERACEAE**	
	Curcuma petiolata Roxb.	Mala
	Costus speciosa Smith	Palan - taunghwe
	Globba pauciflora King	
	Globba bulbifera Roxb.	
63.	**AMARYLLIDACEAE**	
	Crinum amoenum Roxb.	Katta.
64.	**DIOSCOREACEAE**	
	Dioscorea spp.	
65.	**SMILACACEAE**	
	Smilax prolifere Roxb.	Sein - na - baw
66.	**COMMELINACEAE**	
	Commelina bengalensis L.	Wet - kyut
	Commelina nudiflora L.	Wet - kyut
67.	**PALMAE**	
	Phoenix aculis Buch - Ham	Thin - baung
68.	**ARACEAE**	
	Arisaema consanguineum Schoot	
	Amorphallus bulbifera (Roxb.) Blume	
69.	**CYPERACEAE**	
	Cyperus compressus L.	Wet - la
	Scirpus grossus L.	
70.	**GRAMINAE**	
	Chrysopogon aciculatus (Retz) Trin	Nauk - po - myet
	Dichanthium acricosum (L.) A. Camus	Indaing - myet - kha
	Echinochloa crus - galli (L.) Beauv	Myet - cho
	Echinochloa notabile (Hook. F.) Rhind	Wauyon - myet
	Eragiostis gangetisa Steud.	Gyoga - myet
	Erianthus ravennae Beaun.	Thekke - myet
	Gigantochola wanet E.G. Camus	Wa - net

Pennisetum spp.	Myet - pan
Sefaria lutesens Hubb	Kywe - mi - bok
Themeda intermedia (Hack.) Dur & Jack	Myauk - mi

71. <u>POLYPODIACEAE</u>

Adiantum phillippens L.
Microsorum membranceum (Don) Ching
Pteris venusta Kuntze
Pyrrosia lanceolata Vel aff.
Selaginella repanda (Dsev). Spring
Thelypteris torresiana (Gaud). Alst
Tectonia spp.

References

1. A. Long.The dry Zone of Burma.The Burmese Forester. Vol X111 No. 1 June 1962
2. U Tun Yin. Mount Popa And Hidden Burma.
3. Proposed Popa Mountain Park Master Plan 1982-84. Prepared By UNDP /FAO Natural conservation And National Parks Project.. Bur/80/006… December 1981
4. Yin Yin Kyi. Preliminary Report On Vegetation And Flora of Mount Popa… 1992
5. ပုပ္ပါးတောင်ဥယျာဉ်တည်ဆောက်ရေး အစီရင်ခံစာ။ ။ ၁၉၈၁၊ ဒီဇင်ဘာလ
6. Professor Dr. Ruth Kiew. Plant Taxonomy, Biodiversity and Conservation 1994.