Leaflet 8/ 91-92

Government of the Union of Myanmar
Ministry of Forestry
Forest Department

Preliminary Report on Vegetation and Flora of Mount Popa

Daw Yin Yin Kyi, B.Sc. [Bot.] [Rgn.]
Staff Officer
Forestry Research Institute
1992

ပုပ္ပါးတောင်တွင်ပေါက်ရောက်သောသဘာဝပေါက်ပင်များနှင့် အပင်ပေါက်ရောက်ပုံကိုလေ့လာခြင်း

ဒေါ်ရင်ရင်ကြည် (B.Sc.[Bot.] [Rgn.])
ဦးစီးအရာရှိ
သစ်တောသုတေသနဌာန၊ရေဆင်း

စာတမ်းအကျဉ်းချုပ်

ပုပ္ပါးတောင်သည် မြန်မာပြည်အလယ်ပိုင်းဖြစ်ဒေသ အပူပိုင်းဒေသတွင် တည်ရှိပြီး စိမ်းလန်းစိုပြေသည့် တောင်တစ်ခုဖြစ်ပါသည်။ အပူပိုင်းဒေသတွင် အဓိကအားဖြင့် မြေနိမ့် လွင်ပြင်ဒေသဖြစ်ပြီး တောခြောက်များဖြစ်သော သန်းဒဟပ်တောခြောက် Than Dahat Forests နှင့်ဆူးပင်တောခြောက် Thorn Forest မျိုးသာပေါက်ရောက်မှုရှိသော်လည်း ပင်လယ်ရေမျက်နှာပြင် အမြင့်ပေ (၄၉၈၁)အထိမြင့်မားသော ပုပ္ပါးတောင်တွင် တောင်ပေါ်တောမျိုး Hill Forests အထက်ရွက်ပြတ်ရောနှောတောခြောက် Dry Upper Mixed Deciou Forests အင်တိုင်းတောနိမ့် Indaing Low Forests မျိုးနှင့်မြက်ခင်းလွင်ပြင် Grassland မျိုးစုံလင်စွာ ပေါက်ရောက်သည်ကိုတွေ့ရှိရ၍ အပင်များပေါက်ရောက်ပုံနှင့် ပေါက်ရောက်ပင်များကို လေ့လာ၍ တင်ပြထားသောစာတမ်း ဖြစ်ပါသည်။

Preliminary Report on Vegetation and Flora of Mount Popa

Daw Yin Yin Kyi, B.Sc. [Bot.] [Rgn.]
Staff Officer
Forest Research Institute

Abstract

Mount Popa is the only prominent Volcano, which became extinct, some hundreds of years ago. It is situated in Kyaukpadaung township, in the plains of dry zone, in central Myanmar; it is one of the few prominent landmark in the area. The Major Forest types of this area are the Dry Forests, Than Dahat Forest and Thorn Forest. However Mount Popa itself is 4981 feet above sea level, and in addition to the Dry Forest type, other types such as Hill Forest, Dry Upper Mixed Deciduous Forest, and Indaing Low Forests types are also found, and these are reduced to Grassland towards the summit. This paper attempts to present the forest types, vegetation and the flora found on Mount Popa.

Contents

1. Introduction

Mount Popa is about 34 miles South East of Pagan, an ancient capital of Myanmar, on the bank of the Ayeyarwady, and 10 miles North East of Kyaukpadaung township of the dry zone area. The Popa volcano, which became extinct some hundreds of years ago, stands out as an easily recognizable landmark visible for 50 miles or more. It precise position is 25˚ 56' N/ by 95˚ 16' E.

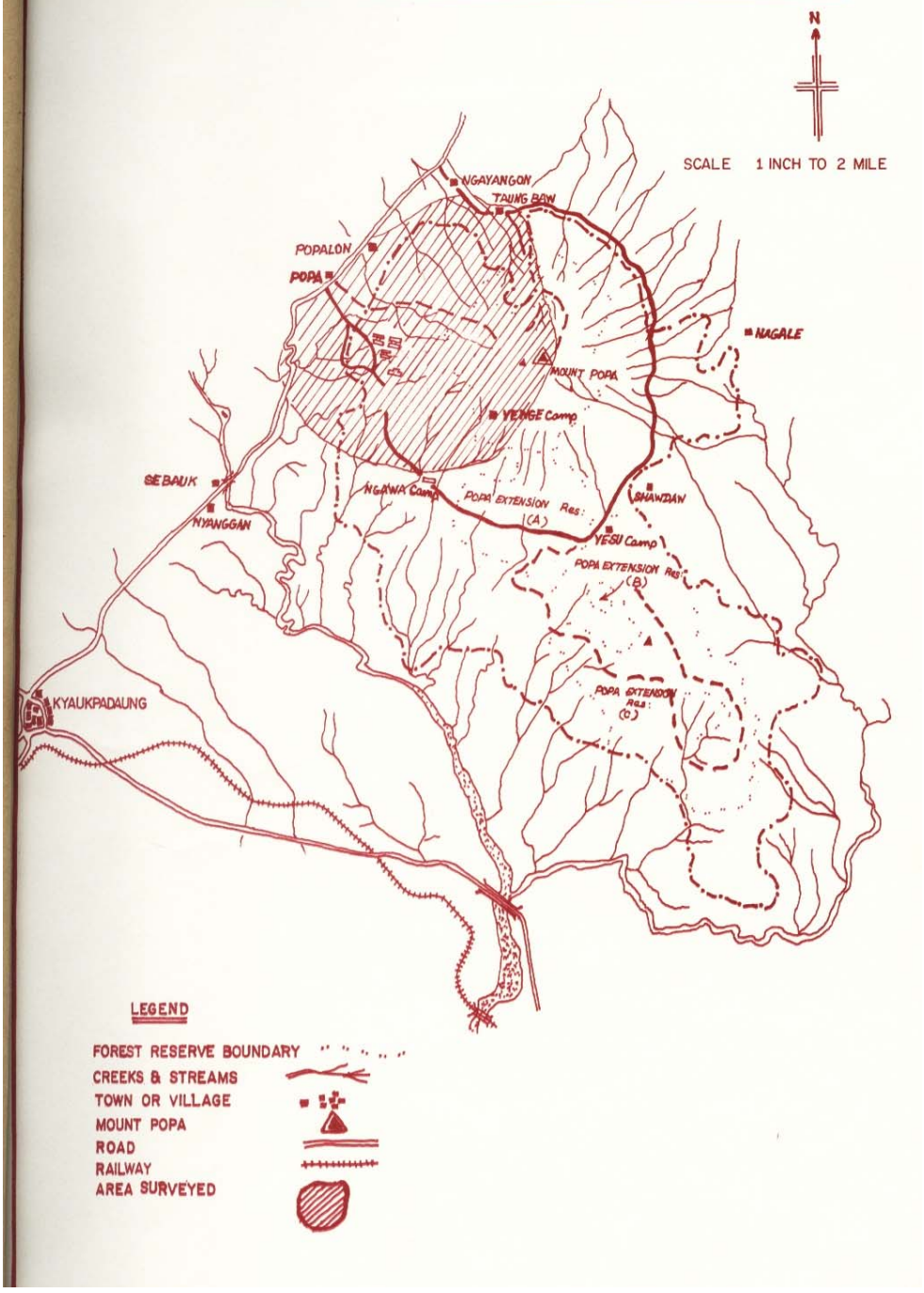
Even thought it is in the dry zone area, it is almost always evergreen, due to its elevation of 4981 feet above sea level. On it can be found the various Dry Forests such as Than Dahat Forests and Thorns Forests on its lower reaches and the Dry Hill Forests, Dry Upper Mixed Deciduous Forests and Indaing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

2. Background

Even though Mount Popa area abounds with so many luxuriant species of trees, herbs, shrubs, climbers and medicinal plants, little or no investigation and research had been done on it. But the Forest Department had opened up the Popa National park and the Environmental Education Centre in 1982 May. This Centre was situated at about 2400 feet above sea level. The aim of this centre is to educate the people about the rich environment and the beneficial effect of the plentiful flora that abounds on the Mount Popa.

As a result of the establishment of this center, the former exdeputy minister directed to the Forest Department to make an investigation as to the flora of Mount Popa area. Subsequently, the Director General of the Forest Department directed the Forest Research Institute, Yezin to make an enquiry into the condition and extent of the Flora of Mount Popa. So I was given the duty of making the survey work of Mount Popa Flora by the Director of Forest Research Institute, Yezin.

MAP SHOWING TREE SPECIES SURVEY OF MOUNT POPA AND ITS ENVIRONS.



3. Method and Observations

The survey work was started in 1986 December till 1987 December; it took one whole year to make a complete collection of the folra specimens due to the fact that the flowering season of the different species occur in differing periods. Collection was done on a monthly basis headed by myself with the aid of a forester, a forest guard and some daily labourers from Popa area.. Popa National Park was chosen as the base camp and from there all the survey were made. The forester and labourers were always at the base camp under my directives for the collection of the Popa Flora. Priority is given to the collection work. Mounting the specimens and the identification work were later carried out at F.R..I., Yezin Herbarium. Some of the specimens were sent to Rijksherbarium, the Netherlands and Harvard University (U.S.A) for identification. Most of the specimens were identified by myself at the Yezin Herbarium.

The preliminary survey work was done only on the western part of Mount Popa including the crater area. This is because the whole Mount Popa area is very extensive. So the surveys work of the western part extends from Taung-baw-ywa to Ngawa-camp. The estimated acreage of this survey is about 22,000 acres.

Further more, the area surveyed included the base military training camp, which is situated at the foot of Mount Popa at about 1600 feet and from there the survey is continued up the slope of Mount Popa to the base camp and the Environmental Education Centre (E.E.C.). From the base camp, the survey was made on seven selected areas which were regularly visited twice a month and supervised by me personally for the collection and observation work. During the survey, the following kinds of species had been recorded.

(1) Tree	--- 112 species
(2) Small Tree	--- 67 Spp.
(3) Herbs	--- 30 Spp.
(4) Shrubs	--- 43 Spp.
(5) Climber/Straggling shrub	--- 47 Spp.
(6) Bamboo	--- 1 Spp.
Total Nos. of species	= 300

Among these 300 species, identified species list was shown in the appendix. 72 families could be identified from those 300 species.

Although Popa area is situated in the dry zone, the vegetation exhibited a variety of Forest types, which included Dry Forests, Dry Upper Mixed Decidious Forest, Indaing Low Forest and Dry Hill Forest. Before the second world war, the area around the foot of Mount Popa was composed of large trees. During and after the war, due to the over exploitation and illicit feeling the area became depleted. Above 4000 feet sea level, there is little or no tree all except grassland. As the elevation rises, the trees became stunted and open. At the foot of Mount Popa, trees are still dense and luxuriant.

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. The vegetation seem to be evergreen.

Geologically Mount Popa is an extinct volcano. The soil around the low land area of this Mount is very fertile and the forests were cleared away for making banana plantations. During the Revolutionary Council Administration, the establishment of banana plantations were prohibited and the present plantations were cleared away to make ground for the establishment of eucalytus plantation. (*Eucalyptus camalduensis* Dehn.). For conservation of soil along the eroded areas, the A.R.D.C. had planted exotic Agave species. (*Agave americana* and *Agave sisalana*). Along the slope of the Mount Popa can be found these kinds of vegetation.

Not only the vegatation differed from one another along the slope, the soil types also differ. Above 3000 feet, pine plantation (*Pinus kesiya* Royle ex Gordon.) was established and found not to be very good. Cheery (*Prunus cerasoides* D. Don) was also planted and at present was found to be naturally propagating very well. Meze (*Madhuca longifolia* var. *longifolia*) and Rhododendron species were also found. The Rhododendron was found to be very stunted. Some medicinal plants found on the Mount were also collected and recorded.

The lowest slope and foothills composed of kyun, pyinkado, than, dahat, sha, tanaung, thitya, ingyin, taukkyan, panga, tama, thinwin, nabe, didu, letpan, ohndon, okshit, yinma, tabauk, madama, yon, thindwe-nyo, thit-linda, lunbo, neywe, te, kyetyo, kokko, nibase, mayanin, khaung, thetyin-gyi, kadut, yuzana, zitalaing, thit-magyi, taw-kyetmauk, thi-din, taw shauk, ye-padauk, pyaukseik, kyun-kauknwe, chinyoke, tayaw, zaung-palwe, petthan, mauk-okshit, gyok, zaunggyan, seik-che, kywe-tayaw and tame. The only species of bamboo found was myinwa (*Dendrocalamus strictus* Nees.).

In the area around Popa village, about 1957 feet above sea level and around the foot hills between elevation 2000 feet and 3000 feet, the following species composed of kyun, pyinkado, panga, padauk, ingyin, thitya, yemane and also the only bamboo species of myinwa were found. Thus the lowest slope and foothills of Mount Popa could be classified as Dry Upper Mixed Deciduous Forest Type and Indaing Low Forest growing mixed together. And some other species such as thabye, tamalan, kyetyo, okshit, nagye, zimani, hman, thamin-zabyu, tayaw, gyo, thadi, te, taungphala, kabaung, yinbya, sugyin, suyit, winoo, zinbyu, maya-min, petwunbyu, thit-linda, taungtangyi, kadut, pauk, pauk-nwe, yetha-bye, taw-kyetsa, yindaik, nabe, naywe, thi-din, thit-magyi, lunbo, tabauk, thetyin-gyi and thetyin-kado are also found.

In the area between elevation 3000 feet and 4000 feet, te, thitya, ingyin and in are absent, but thitswele, zinbyu, panga, thabya and petsut are plentiful. The exotic species of Agave Spp. and *Pinus kesiya* Royle ex Gordon plantation could also found in this elevation. Dry Hill Forest Types species could also be found, such as Quercus and Castanopsis species.

Above the 4000 feet elevation the vegetation become sparse and trees of the same species become stunted than the lower elevation tree species. The area about 4801 feet elevation is called the Sababon Taung. Just close to this Sababon Taung, there is the micro-wave radio station. Around this micro-wave station can be found only the Lilly spp., the Phoenix spp. and some plants of the compositae family. The whole area along the slope of elevation 4000 feet and above was covered with grassland. Some Polypodiaceae of ferns were also present. Only three species of trees viz. thit-ni, kadut and thabye could only be found but these trees are also very stunted.

The highest point of Mount Popa is 4981 feet and given the name Hman-pya Taung. Between Sababon Taung (4801 ft.) and Hamn-pya Taung (4981 ft.) can only be found the grassland and a few plants of phoenix spp., lilly spp. and small herbs.

In the crater, can be found some large tree and very dense undergrowth. In very damp places, plenty of medicinal plants and sayo, can be found. Let-tokegyi, neywe, thit-kado, thapan, kadut, yon, thabye, ye-padauk, and some other unidentified tree species were present in the crater.

Medicinal plants such as khan-dauk and sewa-gyi can be found from 3500 feet and above. Sayo and mahaga-kyansit can be found in the moist and damp places only. Selet-wa, a climber can also be found from 3500 feet elevation and above. Some other medicinal plants such as thetyin-gyi, thetyin-kado, yinbya, eikthra-muli, myin-gaung nayaung, mahaga-kyansit and mingo-ga could be found between 2000 feet and 3000 feet level.

Shops in the Popa village area usually sell the root of the following seven medicinal plants in a bundle with accompaning leflets describing the virtues of these plants.

There are:-

(1) Taung tan-gyi
(2) Yinbya
(3) Yazawin
(4) Ahkyaw
(5) Sewa-gyi
(6) Zaung-gyan
(7) Maya-nin

4. Discussion and Conclusion

As a result of this survey work it can be easily seen that although Mount Popa is in the Dry Zone, the vegetation include not only the Dry Forests, but also the Than Dahat forest in the lowest foothill, Dry Mixed Deciduous Forest mixed together with Indaing Low Forest in the lower reaches and Dry Hill Forest in the upper reaches and grassland around the summit.

Of the 300 species collected, only those indentified are described in appendix list. It is also found out that three varieties of sagawa (Michelia champaca) exhibited three different colour and also 3 noticeable different kinds of smell. Two different types of Ingyin exhibiting differing colour in the fruit was also found. One variety is red and the other is green in colour. The vegetation of the Indaing Low Forest type are the same as that of vegetation of the unclassed Forest of Yezin. Associated with Ingyin, are In, Thitya, and some species of Taukkyan, Panga, Te, Nibase, Thit-linda, Lunbo, Nabe, Naywe, Kabaung, and Zinbyun. But one particular of interest is that Thit-si is present in Yezin unclassed forest, but absent in Mount Popa area.

Even the same tree species exhibit differing flowering periods on Mount Popa due to differing elevatious e.g. Thit-ni spp. It is of great interest to have surveyed the Mount Popa as it exhibits differing types of vegetation and differing types of Forest types as the elevation rises, even though it is situated in the dry zone area. Mount Popa is an extremely well known and very interesting landmark in Myanmar.

References

1. A. long -The Dry Zone of Burma (The Burmese Forester Vol. XII 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 Nature Conservation And National Parks Project – Bur/80/006 December 1981.
4. Daw Aye Aye Than (M.Sc. Thesis) University of Mandalay. Angiosperm flora of Mount Popa.

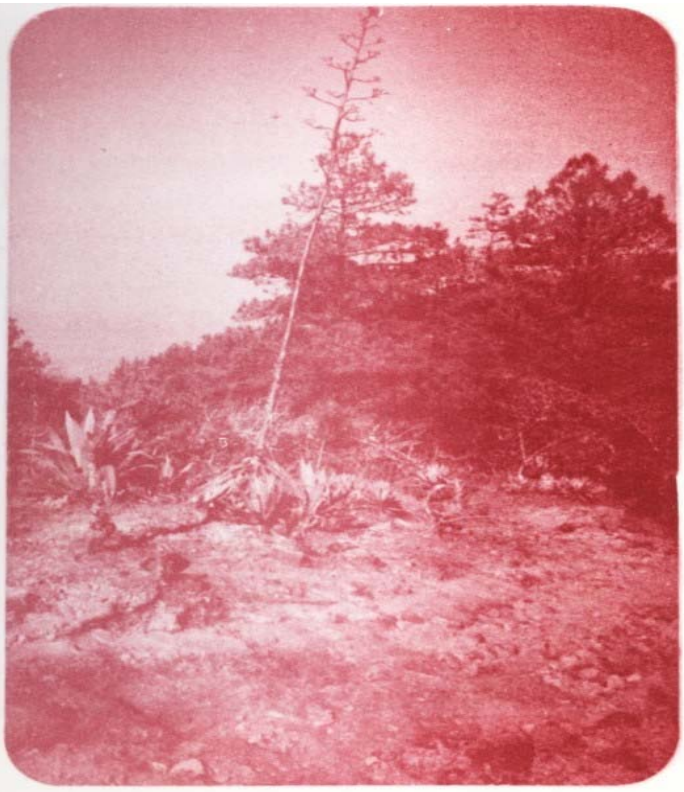
၅။ ပုပ္ပါးဥယျာဉ်တည်ထောင်ရေးအစီရင်ခံစာ။ ၁၉၈၁-ဒီဇင်ဘာ။ သဘာဝထိန်းသိမ်းရေးနှင့် အမျိုးသားဥယျာဉ်များတည်ထောင်ရေးစီမံကိန်း။

Mount Popa

Vegetation such as Lunbo, Nabe, etc. found on the dry upper mixed deciduous forest of the lower reaches of Mount Popa.

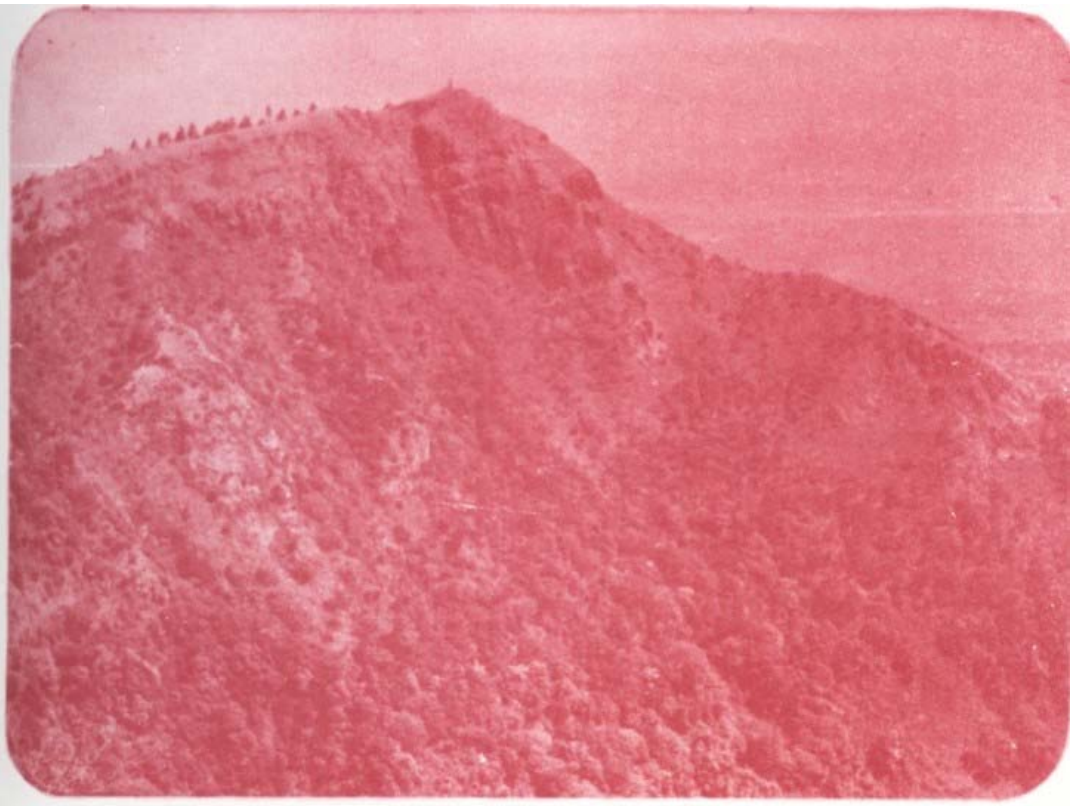
Pinus plantation as seen on the upper reaches of Mount Popa at about 4000 ft.

A view of Taung-kalat seen from 4000 ft above sea level.

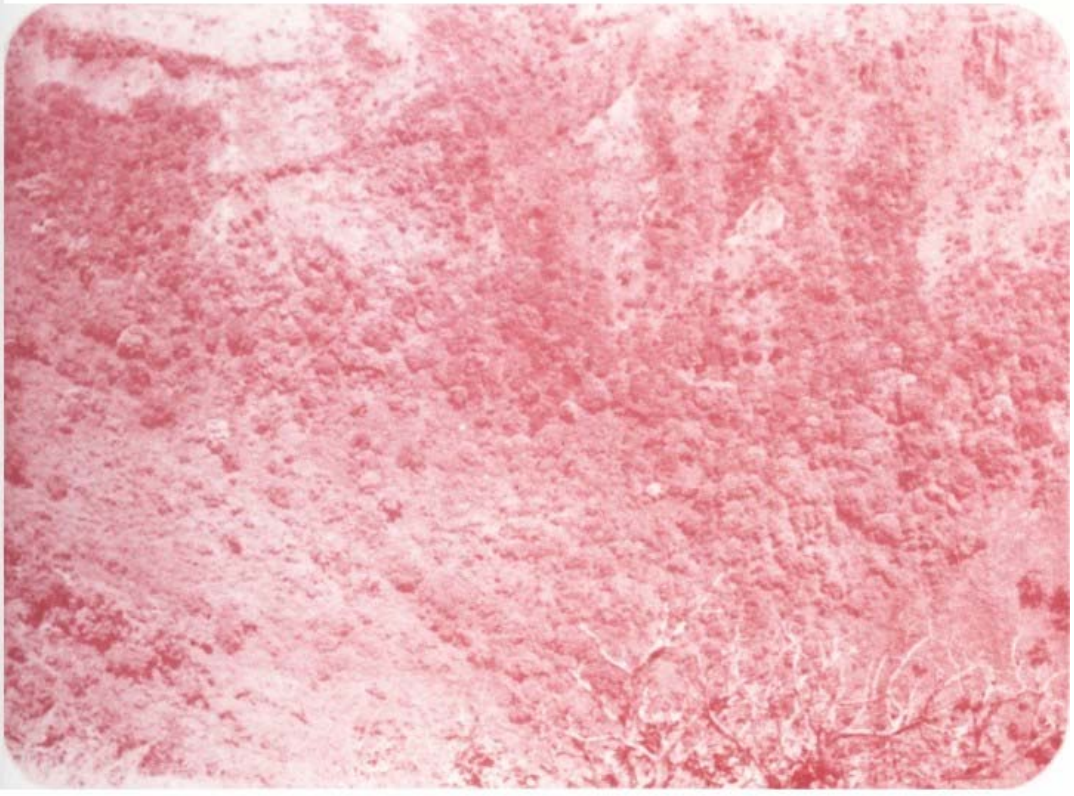


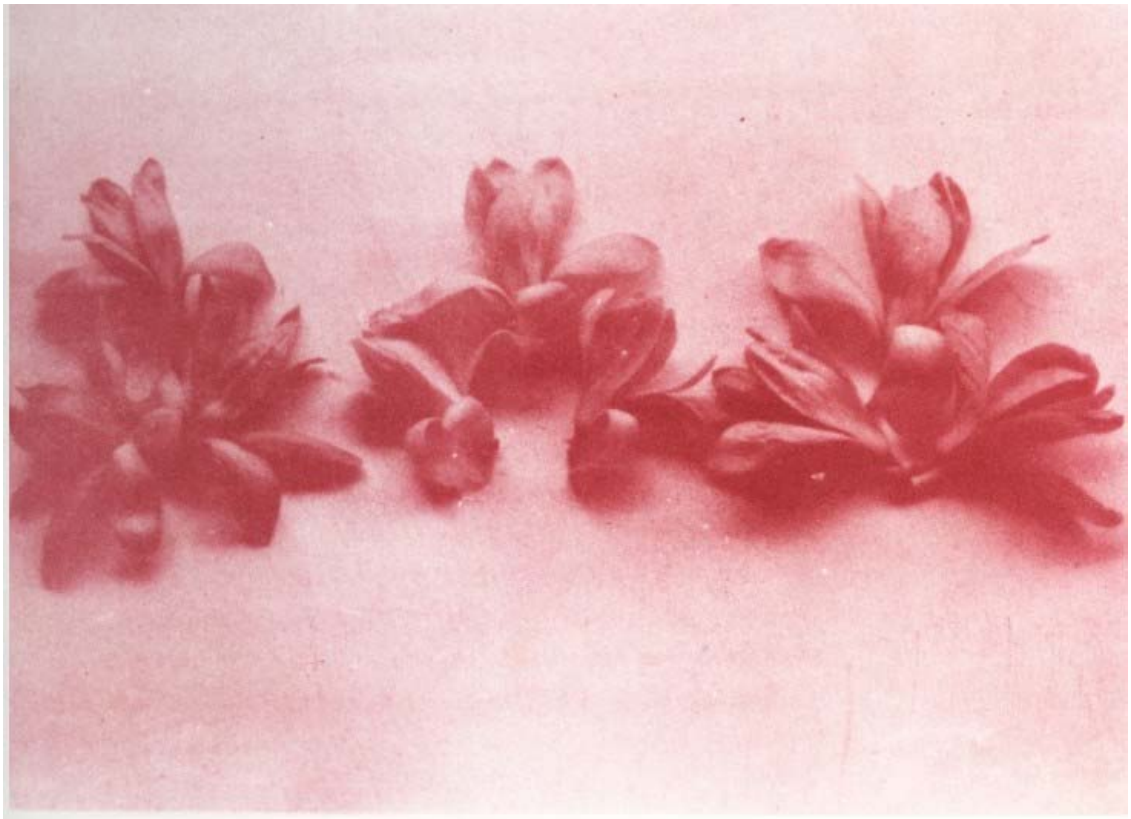
Agave sisalana Perr. As seen on the upper reaches of Mount Popa.

Two varieties of Ingyin fruit (*Shorea siamensis* (kz.) Miq.).



A view as seen from the top of the mount into the crater





Three varieties of Mount Popa Sagawa flower
(*Michetia champaca linn.*)

Appendix – I

List of the Medicinal Plant Around Mount Popa

1.	Argyreia barbigera Chois.	- - - -	Mingo-ga
2.	Aristolochia roxburghiana Klotz.	- - - -	Eik thra-Muli
3.	Berberis asiatica Roxb.	- - - -	Sewa-gyi
4.	Blumea balsamifera DC.	- - - -	Phone-Mathein
5.	Carissa spinanum A. DC.	- - - -	Ah-kyaw
6.	Celastrus paniculatus Willd.	- - - -	Myingaung-nayaung
7.	Clerodendron serratum Spreng.	- - - -	Yinbya
8.	Croton joufra Roxb.	- - - -	Thetyin-kado
9.	Croton roxburghianus Bal	- - - -	Thetyin-gyi
10.	Desmodium triquetrum DC.	- - - -	Shwetu-thanhlet
11.	Heracleum candicans Wall.	- - - -	Taung-phala
12.	Piper attenuatum Ham.	- - - -	Sayo
13.	Pittosporum nepualensis (DC.) Reho & Wilson	- - - -	Mayanin
14.	Polygonum tomentosum Willd.	- - - -	Mahaga-kyansit
15.	Schefflera venulosa Hams.	- - - -	Selat-wa
16.	Thalictrum foliclosum DC.	- - - -	Khandauk
17.	Prema integrifolia L.	- - - -	Taung-tangyi
18.	Santalum album L.	- - - -	Santa-gu
19.	Oxyris arborea Wall	- - - -	Zaung-gyan
20.	Holarrhena antidysenterica Wall.	- - - -	Lattok-gyi

Appendix – II.

List of the Specimens from Mount Popa

1.	RANUNCULACEAE		
	Clematic subumbellata Kurz.	- - - -	Taw-kwanyo
	Naravelia laurifolia Wall.	- - - -	-
	Thalictrum foliolosum DC.	- - - -	Hkandauk
2.	DILLENIACEAE		
	Dillenia pentagyna Roxb.	- - - -	Zinbyun
3.	MAGNOLIACEAE		
	Michelia champaca L.	- - - -	Sagawa
4.	BERBERIDACEAE		
	Berberis asiatica Roxb.	- - - -	Sewa-gyi
5.	FLACOURTIACEAE		
	Flacourtia cataphracta Roxb.	- - - -	Naywe
6.	PITTOSPORACEAE		
	Pittosporum nepaulensis (DC.) Rehoto & Wilson.	- - - -	Mayanin
7.	DIPTEROCARPACEAE		
	Shorea obtusa Wall.	- - - -	Thitya
	Shorea siamensis (KZ.) Miq.	- - - -	Ingyin
8.	MALVACEAE		
	Kydia calycina Roxb.	- - - -	Petwun-ni
9.	BOMBACACEAE		
	Salmalia insignis Schoot & Endl.	- - - -	Didu
10.	STERCULIACEAE		

	Pterospermum semisagittaium Ham.	- - - -	Nagye
	Erythropsis colorata (Roxb.) Burkill	- - - -	Wet-shaw
	Mansonia gagei J.R.Drum	- - - -	Kala-met
	Streculia versicolor Wall.	- - - -	Shaw-byu
11.	TILIACEAE		
	Grewia tiliaefolia Vahl.	- - - -	Tayaw
	Berrya mollis Wall.	- - - -	Petwun-pyu
	Grewia laevigata Vahl.	- - - -	Khwe-tayaw
12.	ELAEOCARPACEAE		
	Elaeocarpus cf. *tectorium* (Lour.) Merr.	- - - -	-
13.	MALPIGHIACEAE		
	Hiptage candicans Hk.f.	- - - -	Zamani
	Hiptage madablota Gaertn.	- - - -	Thit-mani
14.	RUTACEAE		
	Aegle marmelos (L.) Coorea.	- - - -	Okshit
	Glycosmis pentaphylla Correa.	- - - -	Taw-shauk
	Clausena excavata Burm.	- - - -	Pyimdaw-thein
	Toddalia aculeata Pers.	- - - -	Shint-matat
	Clausean heptaphylla W. & A.	- - - -	Taw-pyindaw-thein
	Murraya paniculata (L.) Jack.	- - - -	Taw-yuzana
15.	SIMAROUBACEAE		
	Harrisonia perforata Merr.	- - - -	Sugyin
16.	BALANITACEAE		
	Balanites cf. *roxburghii Planch.*	- - - -	Su-balwe
17.	BURSERACEAE		
	Protium serratum Engler.	- - - -	Thadi
	Garuga pinnata Roxb.	- - - -	Chinyok
18.	MELIACEAE		
	Chukrasia tabularis A. Juss.	- - - -	Yinma
	Melia composita Willd.	- - - -	Pan-tama
	Azadirachta indica A. Juss.	- - - -	Tama
	Walsura villosa Wall. ex. W. & A.	- - - -	Gyo-kamet
19.	OLACACEAE		
	Anacolosa cf *griffithii* Mast.	- - - -	Taw-thanaka
	Olax scandens Roxb.	- - - -	-
20.	CELASTRACEAE		
	Lophopetalum wallichii Kurz	- - - -	Ye-thabye
	Celastrus paniculatus Willd.	- - - -	Myin-gaung-nayaung
21.	RHAMNACEAE		
	Zizyphus rugosa Lam.	- - - -	Zitalaing
	Ventilago madraspantana Gaertn.	- - - -	-
22.	SAPINDACEAE		
	Schleichera oleosa (Lour.) Merr.	- - - -	Gyo
	Sapindus rarak Bl.	- - - -	Kala-kimmun
23.	SABIACEAE		
	Meliosma simplicifolia (Roxb.) Walp.	- - - -	-
	Sabia paniculata Hook. f. & Th.	- - - -	-
24.	ANACARDIACEAE		
	Rhus paniculata Wall.	- - - -	Khaung
	Lannea coromandelica (Houtt.) Merr.	- - - -	Nabe

	Bunchanania lanzan Spreng.	- - - -	Lunbo
	Semecarpus pandurata Kurz	- - - -	-
25.	PAPILIONACEAE		
	Butea monosperma (Lam.) O. Ktze.	- - - -	Pauk
	Butea superba Roxb.	- - - -	Pauk-new
	Dalbergia oliveri Gamble.	- - - -	Tamalan
	Dalbergia culttata Grah.	- - - -	Yindaik
	Dalbergia paniculata Roxb.	- - - -	Thabauk
	Dalbergia ovata Grah.	- - - -	Madama
	Millettia extensa Benth.	- - - -	Wunu
	Millettia pendula Benth.	- - - -	Thinwin
	Millettia brandisiana Kurz	- - - -	Thit-pagan
	Indigofera lacei Craib.	- - - -	Tame
	Pterocarpus macrocarpus Kurz.	- - - -	Padauk
	Rhynchosia cf. *rothii* Benth.	- - - -	-
26.	CAESALPINIACEAE		
	Bauhinia racemosa Lam.	- - - -	Palan
	Bauhinia malabarica Roxb.	- - - -	Chinbyit
	Bauhinia mollissima Wall.	- - - -	Ket lan
	Bauhinia velutina Wall.	- - - -	Swe-daw
	Caesalpinia cf. *enneaphylla*	- - - -	Ngan-swe
	Cassia renigera Wall.	- - - -	Ngu-sat
27.	MIMOSACEAE		
	Albizzia cf. *myriophylla*	- - - -	Baung-meisu
	Albizzia chinensis (Osbeck) Merr.	- - - -	Bon-meza
	Albizzia lucida Willd	- - - -	Thanthat
	Albizzia odoratissima Benth.	- - - -	Thit-magyi
	Albizzia lebbek Benth.	- - - -	Kokko
	Acacia pennata Willd.	- - - -	Suyit
	Acacia leucophloea Willd.	- - - -	Thanaung
	Acacia cocinna DC.	- - - -	Kinmum-gyin
	Acacia catechu Willd.	- - - -	Sha
	Pithecellobium dulce Roxb.	- - - -	Kala-magyi
	Xylia dolabriformis Benth.	- - - -	Pyinkado
28.	ROSACEAE		
	Eriobotrya bengalensis Hk.f.	- - - -	Pet-sut
	Prunus cerasoides D.Don.	- - - -	Cherry
	Rubus spp.	- - - -	
29.	COMBERTACEAE		
	Anogeissus acuminata Wall.	- - - -	Yon
	Terminalia bellerica Roxb.	- - - -	Thit-sein
	Terminalia crenulata (Heyne) Roth.	- - - -	Taukkyan
	Terminalia chebula Retz.	- - - -	Panga
	Terminalia oliveri Brandis	- - - -	Than
	Combretum cf. *latifolium*	- - - -	Kyattet
	Combretum roxburghii D. Don	- - - -	-
	Combretum decandrum Roxb.	- - - -	-
30.	MYRTACEAE		
	Eugenia cuminii (L.) Druce.	- - - -	Thabye-byu

31.	BARRINGTONIACEAE		
	Careya arborea Roxb.	- - - -	Bambwe
32.	LYTHRACEAE		
	Duabanga grandiflora (Roxb.) Walp.	- - - -	Myaukngo
	Lagerstroemia speciosa (L.)	- - - -	Pyinma
	Lagerstroemia villosa Wall.	- - - -	Zaungbale
33.	UMBELLIFERAE		
	Heracleum candicans Wall.	- - - -	Taung-phala
34.	ARALIACEAE		
	Schfflera venulosa Harms.	- - - -	Sei-latwa
	Heteropanax fragrans Seem.	- - - -	Kyaung-sha latto
35.	CORNACEAE		
	Cornus oblonga Wall.	- - - -	-
36.	RUBIACEAE		
	Gardenia sessiliflora Wall.	- - - -	Thamin-za-byu
	Gardenia obtusifolia Roxb.	- - - -	Yingat-gale
	Hymenodictyon excelsum Wall.	- - - -	Kuthan
	Morinda tinctoria Roxb.	- - - -	Nibase
	Morinda exserta Roxb.	- - - -	Nibase
	Mitragyna rotundifolia (Roxb.)	- - - -	Binga
	Psychotria spp.	- - - -	
	Wendlandia glabrata DC.	- - - -	Thit-ni
	Xeromphis dumetrum Lamk.	- - - -	Hman
37.	COMPOSITAE		
	Vernonia volkameriaefolia	- - - -	Panyan-byu
	Verninia roxburghii	- - - -	-
	Anaphalis araneosa DC.	- - - -	Kan-balu
	Helianthus decapitalis L.	- - - -	Taung-negya
38.	ERICACEAE		
	Rhododendron sp.	- - - -	Taung-zalot
39.	MYRSINACEAE		
	Embelia robustia Roxb.	- - - -	-
	Raphanea cf. *neriifolia* (Sieb & Zucc.) Mez	- - - -	Maniawga
40.	SAPOTACEAE		
	Xantolis tomentosa (Roxb.) Rafil.	- - - -	Thayet-cho
	Madhuca longifolia var. *longifolia.*	- - - -	Meze
41.	EBENACEAE		
	Diospyros burmancia Kurz	- - - -	Te
	Diospyros montana Roxb.	- - - -	Gyoke
	Diospyros spp.	- - - -	Thindwe-nyo
42.	SYMPLOCOCEAE		
	Symplocos racemosa Roxb. var. racemose	- - - -	-
43.	OLEACEAE		
	Chionanthus ramiflours Roxb.	- - - -	Tawkyet-sa
	Jasminum spp.	- - - -	Tagwe
	Sehrebera swietenoides Roxb.	- - - -	Myauk-okshit
44.	SALVADORACEAE		
	Azima sarmentosa Benth.	- - - -	Mo-hnan
45.	APOCYNACEAE		
	Aganosma marginata G. Don.	- - - -	Khaung-tan

	Alstonia scholaris.(L.) R.Br.	- - - -	Letpan-kha
	Wrightania tomentosa Roem & Sch.	- - - -	Lettok-thein
	Carissa spinarium A. DC.	- - - -	Ah-kyaw
	Holarrhena antidysenterica Wall.	- - - -	Lettok-gyi
46.	ASCLEPIADACEAE		
	Calotropis procera R. Br.	- - - -	Mayo
47.	BUDDLELACEAE		
	Buddleia asiaticum Lour.	- - - -	Phon-machi
48.	STRYCHNACEAE		
	Strychnos nux blanda A.W. Hill.	- - - -	Kabaung
49.	EHRETIACEAE		
	Ehrehtia laevis Roxb.	- - - -	Taw-kunkauk
50.	CONVOLVULACEAE		
	Porana paniculata Roxb.	- - - -	Nwenyo
	Argyreia barbigera Chois.	- - - -	Min-go-ga
51.	BIGNONIACEAE		
	Heterophragma sulfureum Kurz	- - - -	Thit-linda
	Stereopermum suaveolen DC.	- - - -	Kywe-mangyo-lein
	Oroxylum indicum Vent.	- - - -	Kyaung-sha
52.	VERBENACEAE		
	Tectona grandis Linn.f.	- - - -	Kyun
	Tectona hamiltoniana Wall.	- - - -	Dahat
	Vitex canescens Kurz	- - - -	Kyun-gauknwe
	Vitex penduncularis Wall.	- - - -	Pet-lezin
	Vitex limonifolia Wall.	- - - -	Pet-lezin
	Congea tomentosa Roxb.	- - - -	Thamaga-new
	Clerodendron serratum Spreng.	- - - -	Yinbya
	Premna integrifolia L.	- - - -	Taung-tangyi
	Gmelina arborea Roxb.	- - - -	Yemane
53.	LABIATAE		
	Colebrookia oppositifolia Sm.	- - - -	-
54.	POLYGONACEAE		
	Polygonum tomentosm Willd.	- - - -	Mahaga-kyansit
55.	ARISTOLOCHIACEAE		
	Aristolochia roxburghiana Klotz.	- - - -	Eik-thra-muli
56.	PIPERACEAE		
	Piper attenuatum Ham.	- - - -	Sayo
57.	LAURACEAE		
	Neolitsea cf. *languinosa* Gamble.	- - - -	-
	Litsaea glutinosa (Lour.) C.B.CL.	- - - -	Ondon
58.	SANTALACEAE		
	Santalum album L.	- - - -	Santagu
	Osyris wightiana Wall.	- - - -	Zaung-gyan
59.	EUPHORBIACEAE		
	Antidesma ghaesembilla Gaertn.	- - - -	Antidesma
	Bridelia retuse Spreng.	- - - -	Seik-chi
	Bridelia stipularta Bl.	- - - -	-
	Bischofia javanica Bl.	- - - -	Ye-padauk
	Croton roxburghianus Bal.	- - - -	Thityin-gyi

	Croton joufra Roxb.	- - - -	Thetyin-kado
	Drypetes roxburghii (Wall.) Hurusawa	- - - -	
	Emblica officinalis Gaertn.	- - - -	Zibyu
	Euphorbia pulcherima Willd.	- - - -	-
	Phyllanthus pomiferus Hk.f.	- - - -	Shet-sha-zibyu
	Mallotus phillipenensis Muell.	- - - -	Thidin
60.	ULMACEAE		
	Ulmus lancifolia Roxb.	- - - -	Shone
	Holoptelea integrifolia Planch.	- - - -	Pyauk-seik
	Trema tomentosa	- - - -	Kywe-tayaw
61.	MORACEAE		
	Ficus hispida L.F	- - - -	Kadut
62.	URTICACEAE		
	Boehmeria spp.	- - - -	-
	Villebrunnea rubescens	- - - -	-
	Debregeasia longifolia Wedd.	- - - -	Ye-thankwa
63.	JUGLANDACEAE		
	Engelhardtia spiata Bl.	- - - -	Thit-swele
64.	FAGACEAE		
	Ouercus griffithii Hk. f. & T.	- - - -	-
65.	PINACEAE		
	Pinus kesiya Royle ex. Gordon.	- - - -	Tinyu
66.	ZINGIBERACEAE		
	Curcuma Sp.	- - - -	Malar
67.	AGAVACEAE		
	Agave americana L.	- - - -	Nanat
	Agave sisalana Perr.	- - - -	Nanat
68.	DIOSCOREACEAE		
	Dioscorea oppositifolia Linn.	- - - -	Thindauk
69.	LILIACEAE		
	Lilium spp.	- - - -	-
70.	SMILACACEAE		
	Smilax prolifera Roxb.	- - - -	Sein-nabaw
71.	PALMAE		
	Phoenix aculis Buch-Ham	- - - -	Thin-baung
72.	DRAMINEAE		
	Dendrocalamus strictus Nees.	- - - -	Myinwa

Appendix – III

Result of Some Soil Sample From Mount Popa

Serial No.	Soil Sample	P^H	O.M %	E.C U mho/ml	Total N%	Ava: P%	Texture			
							Sandy %	Silty %	Clay %	Remark
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.	Below 2000 feet	7.0	12.03	100.00	o.3312	0.00055	48.834	26	8.2	Sandy Loam
2.	2000-2500 feet	6.85	8.15	50.00	0.1747	0.00382	20.364	28	40.2	Clay
3.	Above 3500 feet	6.65	9.69	38.75	0.2028	Nil	30.858	24	28.2	Sandy Clay Loam
4.	Top Soil (4981 ft.)	6.5	9.24	31.875	0.7664	Nil	46.644	18	6.2	Sandy Loam
5.	Crater Soil	6.35	11.37	22.5	0.63	0.00044	56.794	18	2.2	Loamy Sand

OM = Organic Matter
E.C = Electrical Conductivity
P^H = Soil Reaction
N = Nitrogen
P = Phosphorus

Appendix - IV

Monthly Rainfall Record Of Popa Area

Sr. No	Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total inches
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1.	1984	-	-	-	6.0	1.75	15.00	1.35	3.75	2.60	9.80	-	-	40.25
2.	1985	-	-	-	0.04	4.0	5.18	1.70	8.05	13.70	6.0	1.8	-	40.83
3.	1986	-	-	-	-	1.6	4.80	7.35	19.25	8.35	8.22	2.85	-	52.42
4.	1987	-	0.09	-	3.25	-	6.25	4.35	11.25	2.50	1.85	2.8	-	33.15
5.	1988	-	-	-	-	8.4	15.60	6.20	2.90	6.45	7.80	1.62	-	48.97
6.	1989	-	-	-	2.40	3.90	5.10	7.85	7.20	10.20	9.15	-	-	45.80
7.	1990	-	-	-	-	4.42	4.25	4.60	3.30	5.80	2.65	0.54		25.56

Appendix – V.

The maximum and minimum temperature in centigrade.

Year Months	1987		1988		1989		1990	
	Daily Maximum	Mean Minimum	Daily Maximum	Mean Minimum	Daily Maximum	Mean Minimum	Daily Maximum	Mean Minimum
JAN	27.78	14.14	27.22	12.22	27.78	15.00	27.22	13.89
FEB	28.89	15.56	28.89	13.89	28.89	16.11	29.44	15.56
MAR	31.11	18.33	33.33	18.33	33.89	19.44	32.22	18.33
APR	35.00	20.56	37.22	20.56	36.11	21.11	33.88	20.00
MAY	34.44	23.89	37.22	22.22	36.11	22.22	35.00	23.33
JUN	28.89	20.00	35.56	21.67	31.67	21.67	29.45	22.11
JUL	31.67	23.33	33.33	22.22	28.89	21.11	31.11	23.89
AUG	30.00	21.11	31.67	21.11	29.44	22.22	30.00	21.67
SEP	30.00	21.11	32.78	21.11	35.00	22.78	32.22	22.22
OCT	30.56	21.67	30.56	20.00	35.00	21.11	33.89	21.11
NOV	28.89	17.22	27.78	17.78	31.11	18.33	29.44	20.00
DEC	28.33	13.89	26.67	12.78	28.33	15.56	27.78	15.00