THAI FOR. BULL. 10 : 47–110. 1977.

Vascular Flora of Sam Lan Forest Park Muang District, Saraburi Province, Thailand

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SUMMARY

The vascular flora of Sam Lan Forest Park, as enumerated in this report, is summarized below.

	Families	Taxa
Pteridophyta	15	47
Gymnospermae	1	1
Dicotyledonae	95	643
Monocotyledonae	24	191
Total	135	882

This includes the following new records for Thailand :

1. Aspidopterys heterocarpa. J. Ar. (Malpighiaceae)
2. Walsura cochinchinensis Harms (Meliaceae)
3. Ampelocissus harmandii Planch. (Vitaceae)
4. Cissus nodosa Bl. (Vitaceae)
5. Mitracarpum villosum (Sw.) DC. (Rubiaceae)
6. Campestigma purpurea Pierre ex Cost. (Asclepiadaceae)
7. Gymnema thorelii Cost. (Asclepiadaceae)
8. Zingiber pellitum Gagn. (Zingiberaceae)
9. Halopegia blumei K. Sch. (Marantaceae)

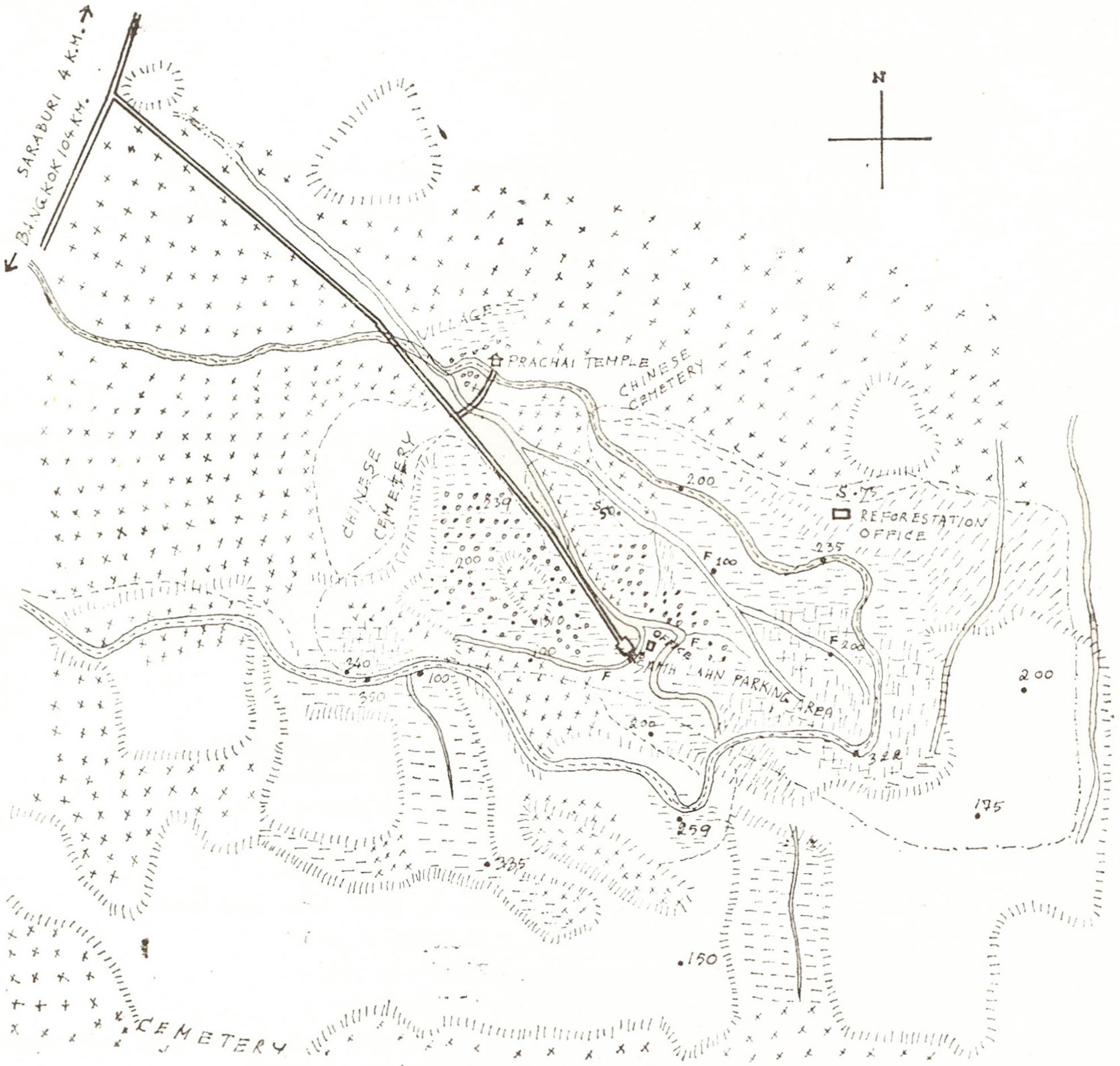
In addition to these new records, there are three additional taxa which, if identified correctly, have not previously been recorded from Thailand :

1. Sterculia longifolia Vent. (Sterculiaceae)
2. Tetrastigma harmandii Planch. (Vitaceae) (MAXWELL, 1975)
3. Globba albiflora Ridl. var. aurea Holtt. (Zingiberaceae).

INTRODUCTION

Sam Lan Forest Park is situated in Muang District, Saraburi Province, Thailand. The centre of the research area lies at approximately 14° 25′ North latitude, 100° 57′ East longitude. Field work was started on 9 October 1973 and was completed at the end of July 1976. An effort was made to collect as regularly as possible in each of the different habitats plus collecting complete sets, i.e. flowers, fruits, and leaves, of each species (or individual plant) to ensure proper identification. The Park, established in 1960, encompasses an area of ca 24 square kilometers of mountainous terrain (Fig. 1) and is under the administration

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Boundary of Sam Lan Forest Park
Sam Lan watershed
Stream, flowing June to November
Tributary stream, flow intermittent July–October
Evergreen forest
Deciduous forest
Bamboo forest
Cultivated areas
Reforested zones
Denuded mountain forests
S — Spring with water January–December, with elevation in metres
F — Waterfalls flowing June–October, with elevation in metres
Road, paved or rocky surface
Road, unimproved surface
Mountain peaks, with elevation in metres

0 500 1000 2000 m

N

14° 25′ N. Latitude
100° 57′ E. Longitude

Approximate position of the centre of the research area

Fig. 1. Plan of the research area with approximate limits of the major forest habitats, water resources, major moutain peaks, and major roads.

of the National Parks Division of the Royal Forest Department. Sam Lan, the name being derived from the name of one of the waterfalls which has three levels (steps), is rather unique in that it has a variety of distinct habitats, which accounts for the very diverse and interesting flora of the area. Included in the research area are 5 waterfalls, several streams and smaller waterways, numerous year-round and temporary springs, and a few permanent ponds.

Past Research

Strange as it may seem Sam Lan was not sampled by Kerr and his associates in the 1920's and early 1930's, and since that time only a few collectors have visited this forest. The Muak Lek and Pasak River areas, some 30–40 km NE of Sam Lan were sampled on many occasions by Kerr, Put, Marcan, and Noe; and many collections were made. Included among these specimens collected are at least 29 new taxa (several have since been reduced) and numerous other species (listed in *Florae Siamensis Enumeratio* (incomplete) by CRAIB (1925–34;) CRAIB and KERR (1951 and 1954); and BARNETT (1962); and with the unpublished (families specimens have been found at BK) many of which have not been found at Sam Lan (Tables 1 and 2). From the labels on many of these specimens in BK a river or limestone habitat is noted and this may account for their absence at Sam Lan since these habitats do not exist there. Unfortunately since Kerr's time the Muak Lek forests (and even some of the mountains) have been largely destroyed and the Pasak River area has been developed. This may also be a reason why so many species collected in this area by Kerr *et al.* have not been found since. Indeed, the entire area surrounding Sam Lan and also many places within the park have also been denuded or otherwise disturbed, I suspect that the limestone at Muak Lek plus the year round flow of the Pasak River provide particular habitats for many species which cannot survive under other conditions — at least not in the non-calcareous or drier habitats at Sam Lan. Therefore, the distribution of many of the species listed in Tables 1 and 2 is limited and for most of these I would not expect to find them at Sam Lan. Other species such as *Bauhinia pulla* Craib, *Atylosia siamensis* Craib, *Drypetes roxburghii* (Wall.) Hur., *Heterostemma piperfolium* K. & G., *Eulophia andamanensis* Rchb. f., *Dioscorea esculenta* (Lour.) Burk. and several other species with a wide distribution in Thailand may be found in the future at Sam Lan.

Table 1 : New taxa collected by Kerr *et al.* from Muak Lek, Pasak River, and nearby areas; Saraburi Province.

Artabotrys oblanceolatus Craib (Annonaceae)
Sageraea reticula Craib (Annonaceae)
Mansonia gagei Drumm. (Sterculiaceae)

Impatiens noei Craib (Balsaminaceae)

Glycosmis subsessilis Craib (= *G. puberula* Ldl. ex Wall. apud Oliv.) (Rutaceae)

Hippocratea (*Reissantia*) *pallida* Craib (Celastraceae) +

Atylosia siamensis Craib (Leguminosae)

Bauhinia pulla Craib (Leguminosae)

B. similis Craib (Leguminosae)

Caesalpinia macra Craib (Leguminosae)

Millettia buteoides Gagn. var. *siamensis* Craib (= *M. pendula* Benth.) (Leguminosae)* (MAXWELL, 1975)

Mucuna nigricans Steud. var. *cordata* Craib (= *M. interrupta* Gagn.) (Leguminosae)* (MAXWELL, 1975)

Rhynchosia marcanii Craib (Leguminosae)

Lagerstroemia undulata Koeh. var. *subangulata* Craib (= *L. subangulata* (Craib) Furt. & Mont.) (Lythraceae)*

Begonia debilis King var. *punicea* Craib (= *B. integrifolia* Dalz.) (Begoniaceae)* (MAXWELL, 1975)

Anotis trimera Craib (Rubiaceae)

Oldenlandia (*Hedyotis*) *comata* Craib (Rubiaceae)

O. (*H.*) *lanceolata* Craib (Rubiaceae)

Linociera microbotrya Kerr (Oleaceae)

Carissa laotica Pit. var. *ferruginea* Kerr (Apocynaceae)

Wrightia viridiflora Kerr (probably *W. laevis* Hk.f.) (Apocynaceae)

Tylophora riparia Kerr (Asclepiadaceae)

Chirita marcanii Craib (Gesneriaceae) +

Dichiloboea albida Barn. (Gesneriaceae)

Ficus glaberrima Bl. var. *siamensis* Corner (Moraceae)

Dioscorea paradoxa Pr. & Bur. (Dioscoreaceae)*

D. pseudo-tomentosa Pr. & Bur. (probably *D. arachidna* Pr. & Burk.) (Dioscoreaceae)

Amorphophallus putii Gagn. (Araceae)

A. saraburiensis Gagn. (Araceae)

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* Collected at Sam Lan

\+ Type specimen not at BK

Table 2 : Species known to have been collected by Kerr *et al.* from the Muak Lek–Pasak River area that were not found at Sam Lan.

Alphonsea glabrifolia Craib (Annonaceae)
Cyathostemma (*Uvaria*) *micranthum* (A. DC.) Sincl. (Annonaceae)
Mitrephora alba Ridl. (Annonaceae)
Miliusa mollis Pierre (Annonaceae)
Rauwenhoffia siamensis Scheff. (Annonaceae)
Buettneria echinata Wall. (Sterculiaceae)
Berria mollis Wall. ex Kurz (Tiliaceae)
Aspidopterys calcicola Craib (Malpighiaceae)
Gouania leptostachya DC. (Rhamnaceae)
Ventilago harmandiana Pierre (Rhamnaceae)
Dimocarpus longana Lour. (Sapindaceae)
Bauhinia harmsiana Hoss. (Leguminosae)
B. winitii Craib (Leguminosae)
Cassia bakeriana Craib (Leguminosae)
Christia pierrei (Sch.) Steen. (Leguminosae)
Crudia chrysantha K. Sch. (Leguminosae)
Crotalaria calycina Schr. (Leguminosae)
Desmodium zonatum Miq. (Leguminosae)
Indigofera linifolia Retz. (Leguminosae)
Mucuna monosperma DC. (Leguminosae)
Pueraria thomsonii Bth. (Leguminosae)
Tephrosia siamensis Drum. apud Hoss. (Leguminosae)
Uvaria picta Desv. (Leguminosae)
Quisqualis conferta (Jack) Exell (Combretaceae)
Alsomitra plena Craib (Cucurbitaceae)
A. pubigera Prain (Cucurbitaceae)
Begonia alaecida C.B.Cl. (Begoniaceae)
Gardenia saxatilis Geddes (Rubiaceae)
G. sessiliflora Wall. ex Kurz (Rubiaceae)
Paederia foetida L. (Rubiaceae)
Xantonnea parvifolia (O.K.) Craib (Rubiaceae)
Adenostemma lavenia O.K. (Compositae)
Vernonia curtisii Craib & Hutch. (Compositae)
Diospyros ferrea (Willd.) Bakh. (Ebenaceae)
D. gracilis Flet. (Ebenaceae)
D. rubra Lec. (Ebenaceae)
Jasminum calcicolum Kerr (Oleaceae)

Jasminum funale Dcne. (Oleaceae)
Linociera parkinsonii Hutch. (Oleaceae)
Heterostemma piperifolium K. & G. (Asclepiadaceae)
Marsdenia cambodiensis Cost. (Asclepiadaceae)
M. thyrsiflora Hk.f. (Asclepiadaceae)
Strychnos lucida R. Br. (Loganiaceae)
Heliotropium bracteatum R. Br. (Boraginaceae)
Ipomoea aculeata Bl. (Convolvulaceae)
I. soluta Kerr (Convolvulaceae)
Aeginetia pedunculata Wall. (Orobanchaceae)
Boea harroviana Craib (Gesneriaceae)
Chirita tubulosa Craib (Gesneriaceae)
Rhynchoglossum obliguum Bl. (Gesneriaceae)
Antidesma microphyllum Hemsl. (Stilaginaceae)
Acalypha delpyana Gagn. (Euphorbiaceae)
Drypetes hainanensis Merr. (Euphorbiaceae)
D. roxburghii (Wall.) Hur. (Euphorbiaceae)
Mallotus spodocarpus A.-S. (Euphorbiaceae)
Pantadenia adenanthera Gagn. (Euphorbiaceae)
Ficus calcicola Corn. (Moraceae)
F. griffithii Miq. (Moraceae)
F. heterophylla L. var. *assamica* (Miq.) Corn.
Laportea disepala (Gagn.) Chew (Urticaceae)
Dioscorea esculenta (Lour.) Burk. (Dioscoreaceae)
D. filicaulis Pr. & Burk. (Dioscoreaceae)
D. prazeri Pr. & Bur. (Dioscoreaceae)
Habenaria furcifera Lindl. (Orchidaceae)
H. trichochila Rolfe ex Downie (Orchidaceae)
Vanilla aphylla Bl. (Orchidaceae)
Cheirostylis aff. *grandiflora* Bl. (Orchidaceae)
Tropidia angulosa Bl. (Orchidaceae)
T. pedunculata Bl. (Orchidaceae)
Pteroceras suaveolens (Roxb.) Holtt. (Orchidaceae)
Trichoglottis cirrhifera Teijsm. & Binn . (Orchidaceae)
Dendrobium delacourii Guill. (Orchidaceae)
Typhonium kerrii Gagn. (Araceae)

Table 3 : Monthly climatic data of some selected stations.

	Jan	Feb	Mar	Apr	May	Jun	Jul
Muang District, Saraburi							
Rain Gauge Station							
Rainfall:							
Average (mm)	13.9	19.5	29.5	64.9	167.2	230.8	234.6
Average rainy days			Observation is unreliable				
Muang District, Lop Buri							
Meteorological Station							
(for Muang District, Saraburi)							
Temperature (°C):							
Average	25.8	28.2	30.1	30.9	30.0	28.9	28.3
Average Maximum	32.7	34.6	36.4	37.1	35.3	33.7	32.7
Average Minimum	19.0	21.9	23.8	24.8	24.8	24.2	23.9
Relative Humidity (%):							
Average	59.8	63.2	64.9	66.6	74.3	76.9	79.2
Mean Maximum	79.4	84.2	86.8	86.8	90.6	92.1	92.9
Average Minimum	40.3	41.3	40.5	43.0	53.5	58.2	61.8
Wind							
Prevailing Direction	NE	S	S	S	S	S	S
Average Force (Knots)	6.5	6.4	7.4	7.1	5.9	6.2	5.5
Common Wind Direction	NE	S,SW	NNE,SW	E,NE	S,SSW,W	S,SW	W
Maximum Wind Force (Knots)	45	52	45	50	40	44	40

Source: Meteorological Department, Office of the Prime Minister, Bangkok.

	Aug	Sep	Oct	Nov	Dec	Total
Muang District, Saraburi						
Rain Gauge Station						
Rainfall:						
Average (mm)	270.2	300.2	106.1	51.5	15.4	1503.8
Average Rainy Days			Observation is unreliable			
Muang District, Lop Buri						
Meteorological Station						
(for Muang District, Saraburi)						
Temperature (°C):						
Average	28.1	27.8	27.5	26.4	25.4	28.1
Average Maximum	32.2	31.6	31.6	31.5	31.5	33.4
Average Minimum	24.0	23.9	23.9	21.4	19.1	22.9
Relative Humidity (%):						
Average	80.8	83.1	78.7	71.2	62.9	71.8
Mean Maximum	93.5	94.6	91.2	86.5	81.2	88.3
Average Minimum	64.1	67.6	63.6	54.8	45.0	52.8
Wind:						
Prevailing Direction	S	S	NE	NE	NE	—
Average Force (Knots)	5.2	4.7	5.3	6.8	6.5	6.1
Common Wind Direction	SW	W	S	NE,S	NE	—
Maximum Wind Force (Knots)	40	40	33	45	45	52

SOILS AND ROCKS

Most of the soils in the upland areas at Sam Lan are developed from weathered andesite, rhyolite, tuff, and in some places the metamorphic products of these. There are a few isolated concentrations of quartz and feldspar. All of the outcrops and boulders are andesite or rhyolite and in a few instances distinct flow structure can be seen. Freshly cut rock surfaces are either dark reddish or olive-green.

The soils are typically shallow, gravelly, and of stony loam often with many large rocks and boulders on the slopes. All areas are well drained and have a medium acid to neutral pH. The soils belong to the Lithosols Great Soil Group which characteristically have thin surface soils over bedrock. There are three phases of Lithsols at Sam Lan:

1. A greyish phase, found in evergreen areas;
2. A brownish phase, found in mixed evergreen/deciduous and deciduous zones; and
3. A reddish phase, only found in climax bamboo (*Thyrsostachys* & *Gigantochloa* zones.

The greyish phase has a thin layer (1–5 cm) of dark brown organic material over a brownish, coarse, sandy loam (5–17 cm), and a bottom layer of reddish-grey coarse sandy loam (17–40 cm). The brownish phase is similiar to the greyish phase except the former has a browner subsoil. The top layer is very dark grey-brown (1–6 cm), over a brown silt loam (6–25 cm) with a light yellowish-brown silt loam (25+cm). The reddish phase is similiar in composition to the two other phases, but has a reddish-brown or yellowish-red subsoil. The very dark brown layer of organics is quite thick (up to 16 cm) and overlies a reddish-brown gravelly to sandy loam (16–37 cm), and the lowest horizon is of a yellowish-red, gravelly to sandy loam (37–75 cm).

While there is no marked difference concerning the origin of the upland soils at Sam Lan, there is a difference in their structure. The high rate of runoff is about equal to the rate of subsurface weathering, thus the soil profiles are shallow. Variation in microclimates directly influenced by wind direction and exposure are perhaps why the bamboo forest have such a thick top soil. In most cases these bamboo zones are facing the SW wind, thus better aeration plus less soil moisture would tend to increase the rate of oxidation of organics. It must also be noted that bamboos, with their thick fibrous root systems, tend to hold soil better than in hardwood zones. Less exposed areas are typically more moist, have more of a moss and lichen flora on the surface rocks, and have more many fungi on decaying branches, logs, etc.

In the mixed evergreen/deciduous zones the soil often varies from a predominantly grey phase to that of a more brown phase. The reddish phase, as clearly seen with the thick organic layer, becomes thinner as the concentration of deciduous species in mixed deciduous/bamboo zones increases.

The reddish colour of the subsoil in the bamboo zones is due to the high oxidation rate of the parent material. This is a result of less moisture being retained in the soil due to the comparatively sparse vegetation allowing more exposure to the sun and the SW wind. These factors, especially during the dry period from November to March, allow a more rapid rate of oxidation. In contrast, the least amount of oxidation occurs in the evergreen areas where more moisture is retained in the soil due to the greater density of the vegetation resulting in less exposure of the soil to the sun and wind. In these areas the subsoil is

characteristically grey. The brown subsoil in the deciduous and mixed zones indicates an intermediate rate of oxidation since the prevailing environmental conditions are more moderate than in either of the other habitats.

Due to the fact that much of the Sam Lan area has been disturbed to the extent that much of the original vegetation has been destroyed and subsequently succeeded by deciduous and bamboo species, it is reasonable to assume that the original soil has changed also. Therefore, it is my belief that since the original forests was mostly evergreen, the major soil phase of the entire area was of the grey lithosol type and that the topsoil was characteristically thin as it is in the evergreen areas today.

DESCRIPTION OF HABITATS

General Considerations

The forest associations such as at Sam Lan, due to the annual dry (November–April) and wet (May–October) periods, have been described by VAN STEENIS (1965) as a monsoon type. Specifically at Sam Lan there are three major forest associations: a dry evergreen monsoon complex, where most of the trees and shrubs retain their leaves and the ground flora remains green throughout the year; a deciduous monsoon habitat, where the trees, etc. are leafless, and the ground flora dry during the dry period; and climax bamboo zones.

The original forest cover of the area was most likely a dry evergreen monsoon association. According to some of the village elders and priests at Pra Chai Temple the forests at Sam Lan have been as they are now for as long as they can remember, that is the limits and types of forests have not changed during their lives. Probably the forests at Sam Lan were initially disturbed when Pra Chai Temple was founded during the Ayutthaya Period (AD 1350–1767). It is also reasonable to assume that the forests have been continuously exploited since the Temple was established. There is also an ancient monument, now in complete ruins, on the top of a mountain near Pra Chai Temple which is said to pre-date it.

During the Ayutthaya Period, the capital of Siam was located at the city of Ayutthaya only ca 50 km SW of Sam Lan. During this era, the nation was very powerful and prosperous and it is not unreasonable to assume that the forests at Sam Lan were exploited by or for the people of this city. The Pasak River, c. 4 km north of Sam Lan, flows through Ayutthaya and then into the Chao Phya River, thus providing an easy means of transporting logs, etc. downstream to Ayutthaya

Phu Khae Botanical Gardens (c. 10 km NW of Sam Lan) 30 years ago, as recalled by **Dr. Tem Smitinand** of the Forest Herbarium, was originally a dry evergreen monsoon forest with many tall trees, e.g. *Dipterocarpus alatus*

Roxb., *Hopea odorata* Roxb., *Pterospermum diversifolium* Bl., and *Mangifera duperreana* Pierre. The understory and ground flora were also of an evergreen type with *Polyalthia parviflora* Ridl., *Streblus taxoides* (Hey.) Kurz, *Aglaonema simplex* Bl., and *Tectaria variolosa* (Wall. ex Hk.) C. Chr. as common components. Unfortunately only a few tall trees remain at Phu Khae today and most of the surrounding area is presently under cultivation.

The entire Sam Lan area, including adjacent areas outside of the Park, was most likely originally similiar to the dry evergreen and mixed deciduous forests at Sakaerat Experiment Station, Pak Thong Chai District, Nakhon Ratchasima Province (SMITINAND *et al.*, 1974). The dry evergreen forest at Sakaerat contains many tree species which are also found at Sam Lan : *Shorea sericeiflora* Fisch. & Hut. *Irvingia malayana* Oliv. ex Benn., *Chaetocarpus castanocarpus* (Roxb.) Thw., *Ficus altissima* Bl., and others. In the mixed deciduous forest at Sakaerat the following deciduous species are also present at Sam Lan: *Hymenodictyon excelsum* (Roxb.) Wall., *Terminalia darfeuillana* Pierre ex Lanes. (*T. pierrei* Gagn.), *Careya arborea* Roxb., *Lannea coromandelica* (Houtt.) Merr., *Canarium subulatum* Guill., etc. In both types of forests at Sakaerat there are many species which have not been found at Sam Lan: *Picrasma javanica* Bl., *Ellipanthus tomentosus* Kurz, *Dischidia rafflesiana* Wall., *Gonocaryum lobbianum* (Miers) Kurz, and others.

There is no dry dipterocarp formation at Sam Lan although *Pentacme suavis* A. DC. var. *siamensis* (Miq.) Smit., *Ochna integerrima* (Lour.) Merr., *Cratoxylum formosum* (Jack) Dyer, *Alsomitra angustipetala* (Craib) Craib, and a few other species which are found in this habitat at Sakaerat are found scattered throughout the deciduous forest at Sam Lan. In several places the cliff flora, especially on the highest peak in the park, resembles the dry deciduous dipterocarp association at Sakaerat, but in these places the vegetation has been greatly disturbed, thus I have not considered these small areas as comprising a distinct habitat since they generally contain other species commonly found in the deciduous forest habitat.

Due to the fact that the original forest at Sam Lan has been largely destroyed or at least greatly disturbed during and since the Ayutthaya Period, the present evergreen and deciduous associations cannot be considered as representing climax stages, albeit they are quite mature in their development. There are many indications that these areas are redeveloping and perhaps only in the bamboo zones can I say that any areas, if left undisturbed, could possibly maintain themselves, but the mixed evergreen/deciduous zones, especially in severely disturbed areas where most of the evergreen facies has been destroyed, will certainly change — probably into deciduous associations since there are generally more deciduous trees and seedlings present plus the ground flora

is of the deciduous habitat type, not at all like that found in the evergreen areas. It is probable that shade and moisture factors are responsible for this gradual change since the soil in the evergreen, deciduous, and mixed evergreen/ deciduous areas is similar.

While it is quite clear that the evergreen and deciduous areas at Sam Lan do not represent a climax stages they are obviously mature in their present development. Thus both primary and secondary development can be seen in the evergreen, deciduous, and mixed zones. It can only be suggested that what I consider to be mature primary development, that is a stable association of large trees and a diverse ground flora at Sam Lan, is possibly the result of the disturbance or destruction of the original forest centuries ago.

Presently after several hundred years of continuous human activity in the area, the forests are apparently maintaining themselves, that is evergreen seedlings are common in the evergreen areas, deciduous ones in the deciduous zones, and both in the mixed zones. The bamboo areas seem to be thriving also. It is only in those places that have been completely destroyed that the previous forest associations have not regenerated. Unfortunately during this period at least 1/3 of the forest has been completely destroyed and the remaining 2/3 has been severely disturbed. Thus, I strongly suspect that this remainder is in dynamic state where several different processes of regeneration are operating. Evidence for this can best be seen in the mixed deciduous/evergreen zones where it appears that more deciduous individuals are developing than evergreen ones.

Several species of trees that were formerly (at least within the past 70 years as recalled by some villagers) much more common are now quite uncommon. These include *Xylia kerrii* Craib & Hut., *Sapium insigne* (Royle) Benth., *Sterculia angustifolia* Roxb. ex Jack (all deciduous) with *Dipterocarpus alatus* Roxb., *Pterospermum diversifolium* Bl., and *Lagerstroemia macrocarpa* Wall. (all evergreen). Logging and charcoal making have taken their toll of many tree species in the Park. *Bombax* spp., *Tetrameles nudiflora* R. Br., *Erythrina stricta* Roxb., and *Spondias pinnata* (L.f.) Kurz, even though they are common deciduous canopy species, are abundant because their wood is unsuitable for lumber or charcoal and thus have been spared. *Spondias pinnata* has also been conserved because of its edible fruit. Some of the rare species of trees, e.g. *Firmiana colorata* (Roxb.) R. Br. and *Cinnamomum iners* Reinw. ex Bl. have been seen in only a few places. One of the two known individuals of *Firmiana* was cut for charcoal and one of the few remaining mature trees of *Cinnamomum*, along with several mature individuals of *Xanthophyllum flavescens* Roxb., were destroyed by fire set by a farmer clearing forested land for cultivation. These species, as well as several others which may not be present as Sam Lan any more, probably were at one time much more common than they are now.

Habitat 1. Evergreen monsoon forest.

The evergreen forest and most of the species comprising this habitat are confined to the upland areas — generally above 150 metres. There are only a few places where one particular tree species dominates an area, e.g. *Mallotus paniculatus* (Lam.) M.-A.* and *Hibiscus macrophyllus* Roxb.,* otherwise the assemblage of trees and the herbaceous ground flora is always diverse and almost any particular species found in this habitat can be found in any evergreen section of the research area. There are quite a few species of evergreen trees which may be considered as being rare, and some of these have been found only once or twice, e.g. *Ilex umbellulata* Loesn., *Beilschmiedia roxburghiana* Nees, and *Lagerstroemia macrocarpa* Wall. The evergreen habitat at Sam Lan is in most places two-storied, but due to cutting the canopy has often been thinned considerably. Some of the taller canopy trees include *Irvingia malayana* Oliv. ex Benn., *Alstonia scholaris* (L.) R. Br., *Pterospermum diversifolium* Bl., and others. Some common understory trees are: *Hydnocarpus ilicifolia* King, *Murraya paniculata* (L.) Jack, *Eurycoma longifolia* Jack, *Knema globularia* (Lmk.) Warb., *Diospyros malabarica* (Desv.) Kost., and *Mallotus philippensis* (Lmk.) M.-A.* Generally the understory zones are quite dense with an assortment of woody climbers, vines, treelets, and shrubs. Among the more common woody climbers are: *Ancistrocladus tectorius* (Lour.) Merr., *Uvaria grandiflora* Roxb. var. *flava* (Teijsm. & Binn.) Sincl., *Hippocratea indica* Willd., and *Bauhinia bracteata* (Grah. ex Benth.) Bak. Common vines are *Limacia triandra* Miers, *Tetrastigma crassipes* Pl., *Toxocarpus villosus* (Bl.) Decne., and *Argyreia obtecta* (Choisy) C.B. Cl. Commonly seen shrubs and treelets include: *Micromelum hirsutum* Oliv., *Streblus taxoides* (Hey.) Kurz, *Chassalia ophioxyloides* (Wall.) Craib, *Ixora cibdela* Craib, *Mallotus oblongifolius* (Miq.) M.-A., and others.

Included among the trees in the evergreen forest areas are numerous epiphytes — orchids, ferns, and parasites. Common examples of each group are: *Aerides falcatum* Lindl., *Drynaria quercifolia* (L.) J. Sm., and *Dendrophthoe pentandra* (L.) Miq. respectively.

The ground flora in the evergreen zones is very diverse and the species found in any particular place are typically numerous and only on rare occasions have I seen one or two species dominating. Among the most common herbs are *Selaginella delicatula* (Desv. ex Poit.) Alst., *Tectaria variolosa* (Wall. ex Hk.) C. Chr., *Ottochloa nodosa* (Kunth.) Dandy, *Globba schomburgkii* Hk. f., *Amomum uliginosum* Koen., *Hedyotis ovatifolia* Cav., *Peliosanthes violacea* Wall., *Aglaonema simplex* Bl., and *Aeginetia indica* L. —a root parasite.

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* Secondary forest species common in disturbed evergreen zones.

The evergreen habitat has been disturbed rather severely in some areas. In contrast to the evergreen forests at Khao Yai National Park the evergreen zones at Sam Lan contain very few mature individuals of *Calamus* spp. and relatively few large canopy trees. Due to their usefulness these formerly common components of the evergreen forests at Sam Lan have been removed. However, many immature individuals of *Calamus viminalis* Willd. and saplings of canopy species are common in the understory. In general, the understory and ground flora are, in most places, typical of mature evergreen associations.

Habitat 2. Deciduous monsoon forest.

At Sam Lan there are several large areas that are predominantly or exclusively composed of deciduous canopy and understory species. While it is not uncommon to find an occasional deciduous tree species in the evergreen areas, the deciduous forest habitat described here is quite distinct. The canopy of the deciduous forest is composed of: *Bombax anceps* Pierre var. *cambodiense* (Pierre) A. Robyn, *B. malabaricum* DC., *Pterocymbium tinctorium* (Blanco) Merr., var. *javanicum* (R. Br.) Kost., *Semecarpus cochinchinensis* Engl., *Erythrina stricta* Roxb., *Spondias pinnata* (L.f.) Kurz, *Hymenodictyon excelsum* (Roxb.) Wall., *Sapium insigne* (Royle) Benth., *Tetrameles nudiflora* R. Br., *Afzelia xylocarpa* (Kurz) Craib, and others (Fig. 2).



Fig. 2. Deciduous Forest. Note open patches where *Eupatorium odoratum* L., *Imperata cylindrica* (L.) P. Beauv., and *Pennisetum purpureum* K. Sch. have quickly taken over after a fire in late December 1973. 28 December 1974.

In contrast to the evergreen habitat the deciduous areas have a rather thin understory and a sparse ground flora. Some of the more frequently encountered woody understory species include *Colona winitii* (Craib) Craib, *Terminalia darfeuillana* Pierre ex Lanes., *Butea superba* Roxb., *Dalbergia pierreana* R.Br., *Entada phaseoloides* (L.) Merr., and others. Common vines include: *Alsomitra angustipetala* (Craib) Craib, *Dioscorea hispida* Denn. var. *reticulata* Hk.f., *D. pierrei* Pr. & Burk., *Stemona collinsae* Craib, *Tinospora* spp., and others. Among the more common ground flora species are: *Zingiber zerumbet* (L.) Sm., *Scaphochlamys* aff. *rubromaculata* Holtt., *Setaria pallide-fusca* (Schumach.) Stapf & Hubb., *Thespesia lampas* (Cav.) Dalz. & Gibs., *Arisaema cuspidatum* (Roxb.) Engl., *Amorphophallus longituberosus* (Engl.) Engl. & Gehrm., and others. Included in the ground and understory flora are numerous seedlings and saplings of deciduous canopy species.

During the dry season from late November to early May, the deciduous habitat is almost entirely leafless and very few herbaceous species can be seen on the ground. However, during this time a few species of evergreen epiphytes (mostly Orchidaceae and Loranthaceae) can be seen in some of the taller trees. Some of the more obvious examples are: *Cymbidium simulans* Rolfe, *Aerides falcatum* Lindl. (both Orchidaceae) and *Scurrula atropurpurea* (Bl.) Dan. (Loranthaceae). *Hoya kerrii* Craib (Asclepiadaceae), an evergreen vine, is found only in this habitat at Sam Lan. Scattered throughout the deciduous zones are patches of evergreen understory species which become more common in mixed evergreen/deciduous zones. Some of these species are: *Memecylon ovatum* Sm., *Ixora cibdela* Craib, and *Streblus taxoides* (Heyne) Kurz. Quite often a few epiphytic species of Orchidaceae, *Pyrrosia adnascens* (G. Forst.) Ching, and *Drymoglossum piloselloides* (L.) Presl can be found in these areas.

The deciduous forest during the dry period is not as monotonous as it would seem, for almost all of the deciduous species and some of the epiphytic Orchidaceae flower and fruit during this time. Leaves for many of the deciduous trees, e.g. *Bombax* spp. and *Lannea coromandelica* (Houtt.) Merr., develop after the flowers, and sometimes the fruits have fallen (Fig. 3).

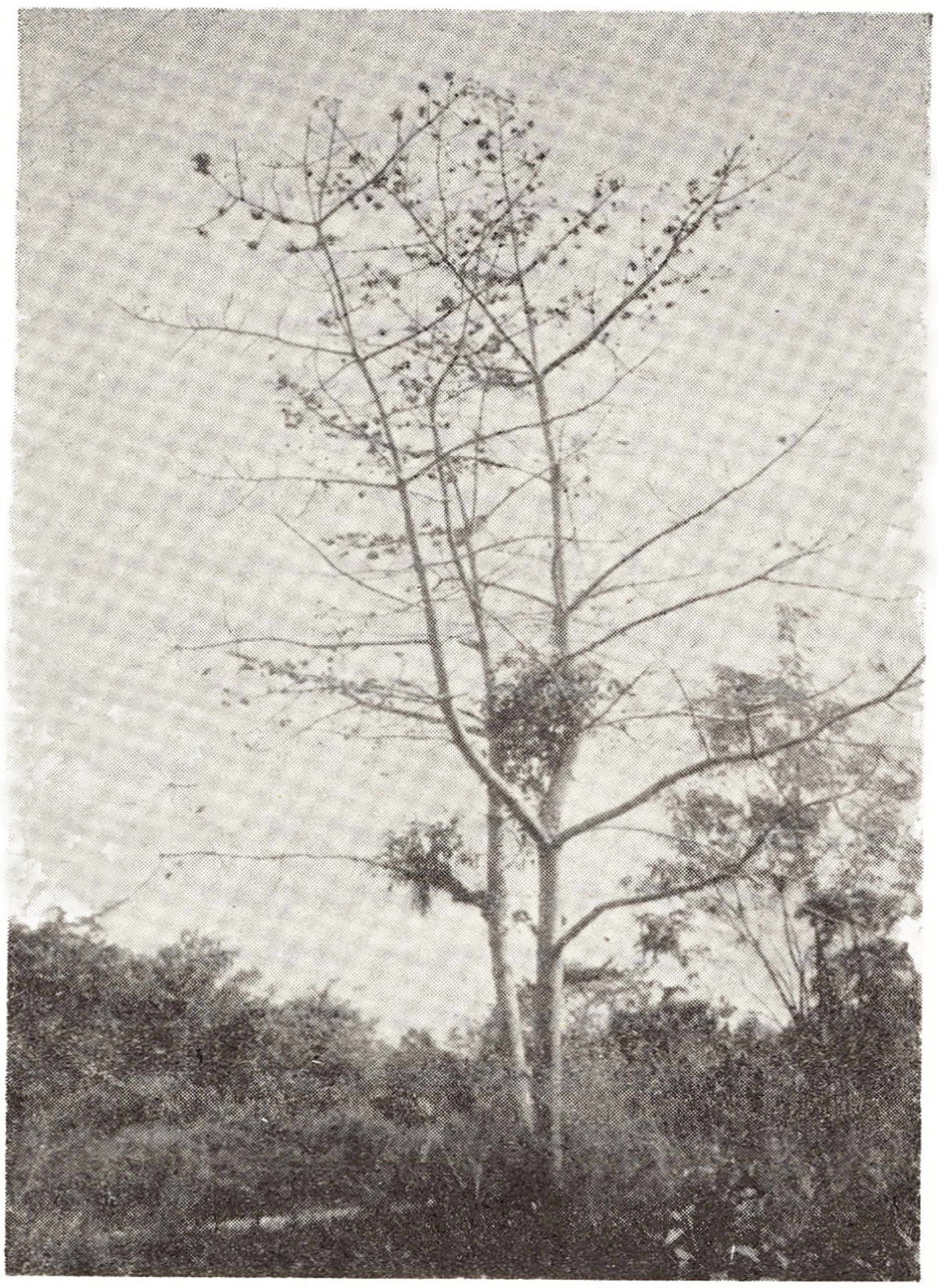


Fig. 3.

Bombax malabaricum DC., in flower, with *Dendrophthoe pentandra* (L.) Miq., a parasite, and *Viscum articulatum* Burm. f., a hyperparasite. 22 January 1975.

Habitat 3. Bamboo forest.

The bamboo habitat at Sam Lan is restricted to several upland areas which seem to represent climax development. These areas, in many cases, are either mixed with or closely adjacent to deciduous zones. There are four major species of bamboo found in the bamboo habitat at Sam Lan: *Bambusa tulda* Roxb., *Gigantochloa albo-ciliata* (Mun.) Kurz, *Thyrostachys siamensis* Gamble, and *Bambusa arundinacea* (Retz.) Willd. — the first three sepecies being much more common than the last. Another species of bamboo, *Schizostachys aciculare* Gamble is not generally found in the bamboo association, since it is mainly a species which grows in disturbed areas in the evergreen, deciduous, and bamboo habitats. I have been told by some of the older villagers that *Bambusa arundinacea*, up until about 30 years ago, was much more common, but since then much of it has been cut; since being the largest and strongest bamboo in the area, it is readily sought as a building material.

The most interesting feature of the bamboo habitat is the ground flora which consists almost entirely of many species of Zingiberaceae and Orchidaceae — several of which are rare, e.g. *Curcuma parviflora* Wall., *Liparis sutepensis* Rolfe ex Downie., and *Pecteilis sagarikii* Seid. (Fig. 4). The bamboo habitat is composed of clumps of bamboo with overhanging branches which provide quite a bit of shade during the wet period. During the dry period the ground becomes quite dry and the bamboo leaves either wilt or drop off; thus there is little shade during this time and generally speaking there is not much green to be seen on the forest floor. At this time of maximum exposure and minimum rainfall several species flower before their leaves appear, e.g. *Kaempferia rotunda* L., *Gagnepainia* sp. (both Zingiberaceae), and *Eulophia andamanensis* Rchb.f. (Orchidaceae). It is not until after the wet period has arrived (May to June) that the majority of the ground flora species develop leaves and eventually flower.



Fig. 4. The ground flora in the bamboo forests consists mainly of many species of Orchidaceae and Zingiberaceae. In this photo *Curcuma domestica* Val. (in flower), *Globba schomburgkii* Hk. f., and an infrequent component, *Smilax luzonensis* Presl, are shown. 6 October 1974.

The bamboo areas do not have any understory and from May to November the ground flora is typically luxurious and composed almost exclusively of perennial species of Orchidaceae and Zingiberaceae. Some common orchids are: *Geodorum purpureum* R. Br., *Habenaria columbae* Ridl., and *H. dentata* (Sur.) Schltr. Among the more frequently found zingibers are: *Boesenbergia pandurata* (Roxb.) Schltr., *Curcuma domestica* Val., *Globba laeta* K. Lar., *G. macrocarpa* Gagnep., *Kaempferia pulchra* Ridl., *Zingiber rubens* Roxb., and others. *Begonia integrifolia* Dalz. (Begoniaceae) and *Leea setuligera* C.B. Cl. (Leeaceae) are also found in this habitat and less frequently in deciduous forest ground covers.

As noted in the discussion on soils, the organic layer in the bamboo forests is very thick. The distribution of the herbaceous ground flora in the bamboo habitat corresponds closely with this thick organic layer which in turn correlates directly with the depth of the fibrous root system of the bamboo clumps. Except in a few places in mixed bamboo/deciduous zones this bamboo-type ground flora and soil structure is not found in any other habitat at Sam Lan.

Due to the fact that there seems to be very little evidence of succession in these bamboo zones, plus the fact that the bamboo areas have remained as a stable system for many years (evidence for this is shown by the very thick organic layer of topsoil), I consider these areas as representative of a climax type of forest development. It seems that these areas have remained generally undisturbed since the destruction of the original forest cover and have remained as they presently are for centuries.

Habitat 4. Mixed forests.

The most widespread forest type found at Sam Lan are the mixed associations: evergreen/deciduous and deciduous/bamboo. Most of the evergreen/deciduous zones have been disturbed since regenerating (cut) stumps of many formerly large trees, both evergreen and deciduous species, are found together along with mature individuals. Due to their usefulness as timber or for high quality charcoal, both living and rotting stumps of *Terminalia darfeuillana* Pierre ex Lanes., *Lagerstroemia duperreana* Pierre ex Gagnep., and to a lesser extent *Cratoxylum cochinchinense* (Lour.) Bl., and *Dialium cochinchinense* Pierre (all deciduous trees) are mixed with *Irvingia malayana* Oliv. ex Benn., *Hydnocarpus ilicifolia* King, and *Sandoricum koetjape* (Burm. f.) Merr. (all evergreen trees). The stumps of many of these trees and the trunks of many of the undamaged individuals have diameters (DBH) of over 50 cm. The majority of most of these stumps were cut during the Japanese occupation over 30 years ago since the regenerating stems often have diameters of over 20 cm — that is about 30–40 years growth. There are also many places in the mixed evergreen/deciduous zones

that have predominantly deciduous understory species, e.g. *Colona winitii* (Craib) Craib, *Cassia garrettiana* Craib, and *Harrisonia perforata* (Blanco) Merr. (all deciduous). Often there are places where the original forest has been severely disturbed and the present understory is, in many places, secondary. A common evergreen understory species, *Allophyllus cobbe* (L.) Raeusch., is also a secondary-type species, and is found scattered throughout the mixed evergreen/deciduous forests.

These mixed evergreen/deciduous assemblages very greatly and generally speaking represent an attempt of the original forest to redevelop and also rather successful invasions of secondary-type species. In many places the understory and ground flora is of the evergreen habitat type while the canopy is composed mainly of deciduous trees. In other areas the ground flora has more deciduous habitat-type components. I strongly suspect that these mixed evergreen/deciduous areas were originally considerably more evergreen. The distinct evergreen-type ground flora with an evergreen understory in both the deciduous and mixed evergreen/deciduous areas represents a mere remnant of an evergreen forest in which all of the large evergreen canopy trees have been removed (Fig. 5).



Fig. 5. Mixed Forest. This is a disturbed zone in which most of the canopy has been removed. The understory and ground floras are of a mixed nature with both evergreen and deciduous habitat components. Trees shown include *Hydnocarpus ilicifolia* King, *Knema globularia* (Lmk.) Warb., and *Memecylon ovatum* Sm. The large liana is *Entada phaseoloides* (L.) Merr. 15 December 1974.

Some of the mixed evergreen/deciduous associations have a predominantly deciduous facies probably because of the fact that much of the evergreen ground flora and understory was destroyed along with the removal of the canopy trees. Perhaps due to exposure and moisture balance factors more deciduous trees, shrubs, etc. have been able to survive and mature in these severely disturbed areas. As noted above, the soils of the evergreen, deciduous, and mixed evergreen/deciduous areas are quite similiar. Therefore, the mixed zones are in a dynamic state of redevelopment and succession; since in the past these areas have been disturbed on several occasions which has enabled the extremely mixed and varied facies of these areas to appear as they are today.

Probably in the past the evergreen sections of Sam Lan were more extensive than they are now and many of the presently mixed associations were most likely evergreen at one time. Since the floristic history of the area is unknown it is very difficult to determine what the place was like even 100 years ago. Without a doubt the area has always had deciduous species, but it is most likely that many formerly evergreen areas have been taken over by deciduous species due to cutting.

The mixed deciduous/bamboo areas are also quite variable in their composition. In these areas the ground flora consists of the typical bamboo facies in areas where bamboo (*Thyrostachys* and *Gigantochloa*) predominates and where the organic layer of the soil is thick. More of a deciduous habitat ground cover and understory has developed where there are more deciduous trees, shrubs, etc. and fewer bamboo. The organic layer of the soil is also considerably thinner. Thus there is no typical mixed deciduous/bamboo facies since the variation ranges from predominantly deciduous with some bamboo, to mostly bamboo with some deciduous species. Without a doubt this type of forest development is the result of severe and probably repeated disturbance of the original forest. As for the deciduous members of this complex it is quite apparent that they have been exploited for their timber or have been made into charcoal. Cut and regenerating stumps are common and scattered throughout all of the mixed forests are remnants of charcoal ovens and pits. The bamboo has suffered because during the wet season each clump sends up new shoots which are readily collected by the villagers and prepared as various dishes. As the old shoots die and there are fewer new shoots to replace them the bamboo clump eventually dies prematurely without having flowered. Secondary species are then able to invade, thus the changing nature of the mixed deciduous/bamboo zones, as with all the other areas at Sam Lan, into secondary thickets and brush is largely a result of human activity.

Habitat 5. Marsh association.

In contrast to the other habitats at Sam Lan the marsh and aquatic associations have relatively few species. Many of these species, however, can only be found in an open, moist (marsh) or entirely aquatic habitat. Since the marsh flora differs greatly from the aquatic association I have designated both of them as distinct habitats.

The marshes at Sam Lan are wet only during the wet period, and from November to early June (at least until a few weeks after the first rains) the marsh zones are quite dry and barren. Generally the marshes are found in open areas on the periphery of ponds and springs, and in a few places a marsh habitat has developed on flat and bare rock surfaces with only a centimetre or two of wet substrate. Among the more common marsh species are *Utricularia caerulea* L., *Eriocaulon achiton* Koern., *E. xeranthemum* Mart., *Fimbristylis dichotoma* (L.) Vahl, *Hydrolea zeylanica* (L.) Vahl, and *Stylidium tenellum* Swarz. All of the marsh species are herbaceous and all, except *Colocasia esculenta* (L.) Shott. at least in this habitat, are annuals (Fig. 6).



Fig. 6. Marsh Association. This is an open area on a flat outcrop which remains wet from about July to November. The substrate consists of 1–2 cm of wet, spongy plant detritus and algae (probably Cyanophytes). This area is representative of a typical marsh flora although the substrate is usually thicker and composed of sand, gravel, and sometimes some clay. Common species include *Ophioglossum nudicaule* L.f., *Stylidium tenellum* Swz., *Utricularia caerulea* L., *Xyris lobbii* Rend., *Eriocaulon xeranthemum* Mart. and *Scleria caricina* (R. Br.) Benth. 20 September 1975.

Habitat 6. Aquatics.

The aquatic species enumerated in this report are found in ponds, springs, and streams either throughout the year or only during the wet period (May–October). In many other parts of Thailand, some of the aquatics found at Sam Lan remain in water all year and their capacity to reappear after prolonged drought is vividly demonstrated at Sam Lan. Some of those species which are often found in temporary aquatic habitats at Sam Lan are *Utricularia aurea* Lour., *Barclaya longifolia* Wall., *Marsilea crenata* Presl, *Blyxa japonica* (Miq.) Maxim. ex Asch. & Gurk., and *Ceratopteris thalictroides* (L). Brong. Among the species requiring a permanent aquatic habitat, that is they cannot tolerate drought, are *Salvinia cucullata* Roxb. ex Bory, *Azolla pinnata* R. Br., *Lemna perpusilla* Torr., *Hydrocharis dubia* (Bl.) Backer, and *Ceratophyllum demersum* L. (Fig. 7).



Fig. 7. *Blyxa japonica* (Miq.) Maxim. ex Asch. & Gurk., atypical aquatic species, in a pool at the base of a waterfall. 20 September 1975.

Habitat 7. Stream and waterfall zone; and

Habitat 8. Rock/Cliff flora.

I have distinguished these two habitats because most of the species comprising each particular group generally are not found in another habitat. While it is true that most of the species found in a stream/waterfall zone are also

in an evergreen or deciduous macroclimate, the particular niche or microclimate for each of these species merits special consideration. The same is generally true for the rock/cliff assemblages, however the surrounding macro-habitats with these species vary considerably.

All the streams and waterfalls at Sam Lan flow only during the rainy season, and during the dry season the associated micro-habitats are quite dry and almost entirely barren. The species found in this habitat require quite a bit of moisture and are rarely found outside of the stream/waterfall areas. Many of these species can be found on rocks where a thin layer of organics has developed, on sand, or on humus. Some of the more common species found in this micro-habitat include *Phyllagathis hispida* King, *Impatiens patula* Craib, *Chirita anachoreta* Hance, and *Bolbitis appendiculata* (Willd.) K. Iwats., *Poikilospermum suaveolens* (Bl.) Merr. and *Zanonia indica* L., at least at Sam Lan, are only found along the streams (Fig. 8).



Fig. 8. A typical association of species commonly found along streams at Sam Lan. The tree on the left is *Trewia nudiflora* L., the smaller tree on the right is *Alchornea rugosa* (Lour.) M.A., and the liana (in flower is *Anamitra cocculus* W. & A. 5 November 1973.

It must be noted that *Utricularia striatula* Sm., *Habenaria rhodocheila* Hance, common rheophytes such as *Homonoia riparia* Lour. and *Ficus ischnopoda* Miq. or any species of Hymenophyllaceae are not found at Sam Lan. Although these are common stream/waterfall species in other sections of the Kingdom, even as close as Khao Yai National Park and the waterfalls and rivers near Nakhon Nayok, their absence at Sam Lan can be attributed to the temporary flow and comparatively low volume of water resulting in less spray and humidity in surrounding areas. This also accounts for only two species of Gesneriaceae (both uncommon) at Sam Lan since many species in this family are common in wet, well drained, and shaded habitats.

The rock/cliff habitat is an artificial association of species that are almost exclusively confined to bare rock surfaces. Among this group of vascular plants are numerous species of mosses, liverworts, and lichens which can always be found on rocks and tree trunks in various macro-habitats. Some of the more striking examples of vascular plants in the rock/cliff habitat are *Pyrrosia stigmosa* (Sw.) Ching, *Oleandra undulata* (Willd.) Ching, *Coelogyne trinervis* Lindl., and *Bulbophyllum lepidum* (Bl.) J.J.S., *Platycerium holttumii* Hennipm., *Davallia denticulata* (Burm.) Mett., and *Vittaria ensiformis* Sw. can be found on both rocks and tree trunks (Figs. 9–10).



Fig. 9. Several species at Sam Lan are only found on open, exposed rocks and cliffs. Included in this photo are *Davillia denticulata* (Burm.) Mett., *Coelogyne trinervis* Ldl., and encrusting lichens. 3 November 1974.



Fig. 10. *Platycerium holttumii* Hennipm., a rare and spectacular fern, found on outcrops and in trees in a mixed bamboo/deciduous forest. 20 September 1975.

Habitat 9. Secondary areas.

This habitat includes thickets, woods, fields, and disturbed places in the climax areas. At Sam Lan only some of the species found in the woods and disturbed upland areas are different from those in other disturbed areas. In general, most of these weeds and other invaders are common throughout the research area and do not establish themselves in other undisturbed habitats. Some of the wooded areas about Phra Chai village have an assemblage of woody species which have remained virtually untouched since the areas were originally cut over 50 years ago. Some of the tree species that were originally planted and now form a rather dense canopy 5–10 metres from the ground are *Mangifera indica* L., *Baccaurea ramiflora* Lour. (both for their edible fruits), and *Dipterocarpus alatus* Roxb. (for timber). The ground flora in these wooded areas is somewhat different from other areas in the Park because several species have only been found in the woods, e.g. *Stenochlaena palustris* (Burm.) Bedd; and unusually high concentrations of other species, which are found in much smaller populations in the forests, e.g. *Thelypteris interrupta* (Willd.) K. Iwats. and *Aclisia secundiflora* (Bl.) Bakh.f., are also present here.

The thickets and other overgrown areas contain many species that are not found elsewhere, e.g. *Illigera thorelii* Gagnep., *Aristolochia roxburghiana* Klotz., *Hewittia sublobata* (L.f.) O.K., and others. Among the most common thicket species are *Acacia pennata* (L.) Willd., *Ficus hispida* L. f., *Neyraudia reynaudiana* (Kunth) Keng & Hitch., *Thunbergia grandiflora* Roxb., and many more. In the fields, roadside areas, and other severely disturbed places there are many weeds or otherwise unwanted plants. A few examples are *Eupatorium odoratum* L., *Erigeron sumatrensis* Retz., *Euphorbia hirta* L., *Digitaria adscendens* (H.B.K.) Henr., *Sacciolepis indica* (L.) Chase var. *turgida* (Ridl.) Gill., and many others. Some of the species in this habitat are eaten by water buffalo, e.g. *Chloris barbata* (L.) Sw., *Brachiaria reptans* (L.) Gard. & Hubb., *Aeschynomene americana* L., and a few more.

In recent years, the Royal Forest Department has undertaken a long term project designed to reforest the upland areas of Sam Lan that have been destroyed; *Tectona grandis* L. f. and *Acacia catechu* (L. f.) Willd. have been planted extensively and the growth of the young trees has progressed well.

Secondary forest development

The bamboo associations in the major forest habitats are, in fact, is quite different from those found in the bamboo or bamboo/deciduous zones. These bamboo stands in the evergreen areas appear to be almost entirely secondary with *Schizostachyum aciculare* Gamble dominating along with the diversity and concentration of herbaceous growth being very sparse. Scattered throughout these areas are a few seedlings and trees, e.g. *Grewia paniculata* Roxb., *Flacourtia indica* (Burm.f.) Merr., and other successionary species, and only in a few places is there evidence that primary tree species are taking over. I think the reason for this is that the most recent disturbance of Sam Lan occurred during World War II when the Japanese occupied the area. The remains of their roads, trenches, and charcoal ovens can still be seen, albeit overgrown with secondary species — both hardwood and bamboo. Since the war much of the area has been completely denuded and many other places in the Park greatly disturbed. These disturbed areas are quite obvious and it is reasonable to say that those places with more immature primary species were initially disturbed before those areas consisting entirely of secondary species and other invaders. It is difficult to say just how long it will take for the next primary or mature forest association to redevelop in these disturbed zones, but by observing the development in those places disturbed by the Japanese over 30 years ago, I am certain that it will take quite a bit longer (centuries) for the forest to restore itself to its original condition.

In the case of the denuded areas, I suspect that in time the present cover of *Pennisetum purpureum* K. Sch., *Eupatorium odoratum* L., and other annual weeds will be succeeded by *Schizostachyum aciculare* Gamble or perhaps by perennial grasses such as *Imperata cylindrica* (L.) P. Beauv. and *Neyraudia reynaudia* (Kunth) Keng & Hitch., more soil will develop. Even in this condition succession will take a long time since periodic fires, especially during the dry period, usually destroy most secondary woody species that have germinated (Fig. 2). Areas in these destroyed zones that have been replanted with *Tectona grandis* L. f., that are burned at least once each year, are developing rapidly; since *Tectona* seedlings and saplings are fire resistant.

In some places the destruction has been so complete that no succession has occurred since the combination of burning plus the continuous loss of soil prevents the growth of everything except a few annual weed species. This condition is most vividly seen today at Muak Lek where the original forest was destroyed just after World War II, and since that time there is still only a thin layer of soil that can support only a few grasses and other herbaceous weeds.

In contrast to the bamboo association in the evergreen forest the bamboo zones described for Habitat 3 are much more stable. Evidence for this lies in the fact that there are few places in the bamboo and bamboo/deciduous zones

that have been disturbed, and redevelopment in these areas differs from the original composition and that of disturbed areas in the evergreen forest. These disturbed areas in the bamboo habitat are quickly invaded by *Pennisetum purpureum* K. Sch. and *Saccharum spontaneum* L. which grow rapidly and up to 2 metres high. Throughout the years little succession has become established in these grassy areas, since during the dry season fire destroys most of the tree seedlings which germinated the previous season.

When the original climax (mature) vegetation in the evergreen, deciduous, and bamboo zones has been destroyed the plant-soil relationship is also disturbed. When the balance between nutrient uptake and recycling of organics by decay is disrupted, such as by burning, and logging; the land is unable to support the redevelopment of many woody species because of consequent erosion and leaching resulting in the loss of the topsoil. At Sam Lan I have seen several areas that have been destroyed (along with the Muak Lek area) and in contrast to the soil in the nearby forested areas, these disturbed zones are much more rocky and have a very thin topsoil layer. Erosion scars are also common since only after a few years the rains wash much of the soil away. Details of this phenomenon are described by PENDLETON (1953) and a similiar situation has also been reported for the Sattahip area (MAXWELL, 1974).

Habitat 10. Species that are cultivated and have escaped cultivation.

While this category does not represent a distinct habitat I have included here to note some of the non-native species, which have been successfully introduced (Table 3). These species have not been included in the List of Species since they are exclusively cultivated. Aside from several native species which are cultivated by the villagers, e.g. *Capsicum frutescens* L.,* *Baccaurea ramiflora* Lour., *Phyllanthus emblica* L. (all three for the edible fruits), and various orchids; there are a few introduced species which have spread to other areas. Among the species which have escaped cultivation are *Leucanea leucocephala* (Lmk.) de Wit, and *Ipomoea quamoclit* L. In general the cultivated species have not spread to any great extent and the species which have escaped can only be found infrequently in disturbed areas.

Table 3. Common introduced species found in the research area.

Family	Genus	Species	Habit	Notes
Acanthaceae	*Sanchezia*	*parvibracteata* Spreng. & Hutch.	S	ornamental
Anacardiaceae	*Anacardium*	*occidentale* L.	T	edible fruit
	Mangifera	*indica* L.	T	edible fruit

* Originally from Central and South America, introduced in S.E. Asia centuries ago; now often found scattered in evergreen forests since it has successfully escaped cultivation.

Family	Genus	Species	Habit	Notes
Apocynaceae	*Thevetia*	*peruviana* (Pers.) K. Schum.	T	ornamental
Bambusaceae	*Bambusa*	*flexuosa* Mun.	S	ornamental
	Bambusa	*vulgaris* Schrad.	S	ornamental
	Dendrocalamus	*longispathus* Kurz	S	edible shoots
Bombacaceae	*Ceiba*	*pentandra* (L.) Gaert. var. *indica* (DC.) Bkh.	DT	seed fiber
Cochlospermaceae	*Cochlospermum*	*religiosum* (L.) Alst.	DT	ornamental
Convolvulaceae	*Ipomoea*	*batatas* (L.) Poir.	H	edible tuber
	Ipomoea	*quamoclit* L.	V	ornamental
Casuarinaceae	*Casuarina*	*equisetifolia* J. & G. Forst.	T	ornamental
Cucurbitaceae	*Luffa*	*acutangula* (L.) Roxb.	V	edible fruit
Euphorbiaceae	*Euphorbia*	*triucalli* L.	S/T	ornamental
	Manihot	*esculenta* Gran.	H	edible tuber
Gramineae	*Oryza*	*sativa* L.	H	edible grain
Leguminosae	*Acacia*	*auriculiformis* Cun.ex Benth.	T	ornamental
	Acacia	*catechu* (L.f.) Willd.	DT	timber & cutch
	Bauhinia	*purpurea* L.	S/T	ornamental
	Cassia	*javanica* L. ssp. *nodosa* (B. & H. ex Roxb.) K. & S. Lar.	DT	ornamental
	Cassia	*bakeriana* Craib	DT	ornamental
	Caesalpinia	*pulcherrima* (L.) Swz.	S	ornamental
	Delonix	*regia* (Boj. ex Hk.) Raf.	DT	ornamental
	Leucaena	*leucocephala* (Lmk.) de Wit	S	young leaves, pods edible
	Psophocarpus	*tetragonolobus* (L.) DC.	V	pods edible
	Samanea	*saman* (Jacq.) Merr.	T	ornamental
	Saraca	*indica* L.	T	ornamental
	Tamarindus	*indica* L.	T	pods edible
	Vigna	*cylindrica* (L.) Sk.	V	pods edible
Malvaceae	*Hibiscus*	*schizopetalus* (Mast.) Hk.f.	S	ornamental

Family	Genus	Species	Habit	Notes
Moraceae	*Artocarpus*	*heterophyllus* Lmk.	T	edible fruit
	Ficus	*religiosa* L.	T	ornamenta
Musaceae	*Musa*	*paradisiaca* L. (hybrids)	H	edible fruitl
Myrtaceae	*Psidium*	*quajava* L.	T	edible fruit
Oleaceae	*Nyctanthes*	*arbor-tristis* L.	S	ornamental
Palmae	*Cocos*	*nucifera* L.	T	edible fruit building material
Polygonaceae	*Triplaris*	*surinamensis* Cham.	T	ornamental
Rhamnaceae	*Zizyphus*	*rotundifolia* Lmk.	T	edible fruit
Solanaceae	*Solanum*	*melongena* L.	H	edible fruit
	Solanum	*torvum* Sw.	H	edible fruit
Verbenaceae	*Clerodendrum*	*splendens* G. Don	V	ornamental
Verbenaceae	*Tectona*	*grandis* L.f.	DT	timber

N.B.: T=tree, S=shrub, V=vine, H=herb, D=deciduous

ENUMERATION

The families of Pteridophytes in this report are arranged alphabetically with the genera listed under each in accordance with the interpretation of TAGAWA and IWATSUKI (1972). All the Angiosperm families are listed, with a few modifications, according to the Bentham and Hooker system and all the other taxa in each family are listed alphabetically.

After many species I have noted what I feel to be synonyms, closely related species that may eventually be combined (indicated by "aff."), and taxa that are probably the same which I am uncertain about, that is I have not seen the type specimens or the original descriptions are unavailable, or which other botanists disagree on (MAXWELL, 1975). Following this the most common habitat (1–10) is noted and in many cases other habitats, though less common, are also indicated. Next, the habit of each is given in the following abbreviated form:

T or ET = evergreen tree
DT = deciduous tree
C = woody climber, scandent, liana
V = vine, non-woody climber, creeper
S = shrub
DS = deciduous shrub
H = herb
P = parasite
E = epiphyte (EO, EF — epiphytic: orchid, fern)
GO, GF = ground: orchid, fern
RO, RF = rock: orchid, fern

After the habit the relative abundance of each taxon is given followed by a "+" if it was, as far as I can determine, collected in the Muak Lek–Pasak River area by Kerr and his colleagues, and a "–" if it wasn't. Finally I have indicated the approximate months during which the Pteridophytes are fertile and the Angiosperms in flower, followed, in the latter, by their time of fruiting. In those Angiosperms where only one time span is given, both flowers and fruits can be seen at the same time — often together on the same plant. This is common with many herbs and shrubs. A third category, for deciduous species, indicates when their leaves are present; thus the period when the species is leafless can also be determined.

Herbarium research was conducted at the Herbarium of the Botany Section, Department of Agriculture, Bangkok (BK), and voucher specimens collected at Sam Lan have been deposited in BK with an almost complete set at Aarhus, Denmark and a partial (about half) collection at Leiden, Netherlands.

PTERIDOPHYTA

SELAGINELLACEAE

Selaginella delicatula (Desv. ex Poit.) Alst.; 1,6; H. common,–, June–Nov.
S. intermedia (Bl.) Spr.; 1,6; H. common,–, June–Dec.
S. minutifolia Spr.; 6,7; H, not common, –, July–Nov.
S. ostenfeldii Hiern.; 2,3; H, not common, –, June–Nov.
S. repanda (Desv.) Spr.; 1,6; H, not common, –, July–Nov.

ADIANTACEAE

Adiantum caudatum L.; 1, GF, common, –, Sept.–Jan.
A. philippense L.; 1,6; GF, not common, –, Aug.–Nov.
A. soboliferum Wall. apud Hk.; 1,6; GF, common, –, July–Nov.
Vittaria ensiformis Sw.; 1,7; EF, not common, –, Aug.–Dec.

ASPLENIACEAE

Asplenium nidus L.; 1, EF, rare, –, Jan.–Dec.
A. pellucidum Lam.; 1,6; GF, common, –, July–Nov.

ATHYRIACEAE

Anisocampium cumingianum Presl; 1, GF, not common, –, May–Nov.

AZOLLACEAE

Azolla pinnata R. Br.; 5, H, common, –, veg. Jan.–Dec.

DAVALLIACEAE

Davallia denticulata (Burm.) Mett.; 7, RF, EF; not common, –, Aug.–Dec.

DENNSTAEDTIACEAE

Microlepia speluncae (L.) Moore; 1, GF, not common, –, Aug.–Dec.

LOMARIOPSIDACEAE

Bolbitis appendiculata (Willd.) K. Iwats.; 1,6, RF, GF, common, –, Oct.–Dec.
B. copelandii Ching ex Chr. & Tard.; 1,6; RF, GF, common, –, Oct.–Dec.

MARSILEACEAE

Marsilea crenata Presl; 4,5; H, common, –, Oct.–Dec.

OLEANDRACEAE

Oleandra undulata (Willd.) Ching; 7, RF, not common, –, Aug.–Dec.

OPHIOGLOSSACEAE

Helminthostachys zeylanica (L.) Hk.; 2, GF, rare, –, May–Aug.
Ophioglossum costatum R. Br.; 4, GF, rare, –, May–Aug.
O. nudicaule L.f.; 4, GF, rare, –, May–Aug.

PARKERIACEAE

Ceratopteris thalictroides (L.) Brong.; 4,5; H, common, –, July–Dec.
Cheilanthes belangeri (Bory) C. Chr.; 1,6; GF, not common, –, Aug.–Nov.
C. tenuifolia (Burm.) Sw.; 1,2; GF, common, –, Aug.–Nov.
Doryopteris ludens (Wall. ex Hk.) J. Sm.; 1, GF, not common, –, Sept.–Dec.
Hemionitis arifolia (Burm.) Moore; 6, GF, rare, –, May–Sept.

POLYPODIACEAE

Drymoglossum piloselloides (L.) Presl; 1, EF, not common, –, July–Dec.
Drynaria bonii Chr.; 6,7; EF, RF; very common, –, June–Nov.
D. quercifolia (L.) J. Sm.; 6,7; EF, RF, common, –, June–Nov.
Platycerium holttumii Hennipm.; 1,2,7; RF, EF; rare, –, July–Dec.
Pyrrosia adnascens (G. For.) Ching; 1,7; EF, RF; not common, –, Oct.–Dec.
P. stigmosa (Sw.) Ching; 7, RF, common, + , Oct.–Dec.

PTERIDACEAE

Pteris biaurita L., 1, GF, not common, –, July–Feb.
P. ensiformis Burm.; 1, GF, not common, –, July–Nov.
P. heteromorpha Fée; 1, GF, not common, –, July–Nov.
P. pellucida Presl; 1, GF, common, –, June–Nov.
P. quadriaurita Retz.; 1, GF, common, –, Aug.–Feb.
Stenochlaena palustris (Burm.) Bedd.; 8,4; V. not common, Aug.–Nov.

SALVINIACEAE

Salvinia cucullata Roxb. ex Bory; 5, H, common, –, veg. Jan.–Dec.

SCHIZAEACEAE

Lygodium flexuosum (L.) Sw.; 1, V. common, –, July–Nov.
L. polystachyum Wall. ex Moore; 1, V. very common, –, June–Dec.

TECTARIACEAE (PERANEMACEAE)

Cyclopeltis crenata (Fee) C. Chr.; 1, GF, not common, –, June–Nov.
Lastreopsis parishii (Hk.) Ching; 1,6; GF, not common, –, May–Sept.
Tectaria variolosa (Wall. ex Hk.) C. Chr.; 1, GF, very common, –, June–Dec.

THELYPTERIDACEAE

Thelypteris interrupta (Willd.) K. Iwats.; 1,8; GF, common, –, July–Dec.
T. parasitica (L.) Fosb.; 4, GF, not common, –, May–Dec.

GYMNOSPERMAE

GNETACEAE

Gnetum montanum Mgf.; 1, C. not common, –, Feb.–Apr., June–Aug.

ANGIOSPERMAE
Dicotyledones

RANUNCULACEAE

Naravelia laurifolia Wall. ex Hk. f. & Th.; 8, V, not common, +, Sept.–Nov.

DILLENIACEAE

Dillenia ovata Hk.f. & Th.; 2, DT, not common, –, Feb.–March,
Mar.–Apr., Lvs. Mar.–Dec.
D. pentagyna Roxb., 2, DT, not common,–, Jan.–Feb., Feb.–Mar., Lvs. Mar.–Jan.
Tetracera loureirii (Fin. & Gagn.) Pierre ex Craib; 1, V, common, –, May–July.

ANNONACEAE

Artabotrys harmandii Fin. & Gagn.; 1, C, not common, –, Mar.–Apr., May–June.
Cananga latifolia (Hk.f. & Th.) Fin. & Gagn.; 2, DT, common, –, Mar.–Apr.,
May–June, Mar.–Dec.
Desmos chinensis Lour.; 1, S/C, common, +, Apr.–May, July–Aug.
D. hahnii Merr.; 1, C, common, –, Mar.–Apr., May–June.
Melodorum fruticosum Lour.; 1, T, common, –, Mar.–Apr., May–June.
Miliusa velutina Hk.f. & Th., 2, DT, not common, –, Feb.–Mar., May–July,
Feb.-Dec.
Mitrephora maingayi Hk.f. & Th. var. kurzii King; 1, T, not common, –,
Mar.–Apr., June–July.
Orophea polycarpa A. DC; 1, T, not common, +, Apr.–May, July–Aug.
Polyalthia cerasoides (Roxb.) Benth. ex Bedd.; 2, DT, not common, –, Jan.–Apr.,
Feb.–July, Jan.–Nov.
P. lateriflora (Bl.) King; 1, T, not common, –, Feb.–Mar., Apr.–June.
P. parviflora Ridl. (probably = P. debilis (Pierre) Fin. & Gagn.); 1, ES,
not common, –, Jan.–Feb., Mar.–May.

Uvaria dulcis Dunn. [Anomianthus dulcis (Dun.) Sincl.]; 1, C, not common, –, Apr.–May, June–Aug.
U. grandiflora Roxb. var. flava (Teijsm. & Binn.) Sincl. (aff. U. dac Pierre apud Fin. & Gagn.): 1, C, common, –, Mar.–Apr., May–July.
U. rufa Bl.; 1, C/S, not common, –, Apr.–June, July–Aug.
Xylopia caudata Hk. f. & Th.; 1, T, not common, –, Apr.–May, June–July.

MENISPERMACEAE

Anamirta cocculus (L.) W. & A.; 1, 6; C, not common, + Oct.–Nov., Feb.–Mar.
Cyclea barbata Miers; 8, 2, V, common, –, Oct.–Nov., Nov.–Dec.
Limacia triandra Miers; 1, 8; V, comon, –, Jan.–Dec.
Stephania japonica (Thunb. ex Murr.) Miers var. discolor (Miq.) For.; 8,6; V, common, –, Jan.–Dec.
S. glabra (Roxb.) Miers, 2, V, not common, –, Apr.–May, May–June.
Tinospora crispa (L.) Miers ex Hk.f. & Th. DV, 2, common, –, Dec.–Feb., Apr.–May, leaves May–Dec.*
T. sinensis (Lour.) Merr.; 2; DV, common, –, Jan.–Mar., leaves May–Dec.*

NYMPHAEACEAE

Barclaya longifolia Wall.; 5, H, common, –, Sept.–Nov.
Nymphaea pubescens Willd.; 5, 9; H, common, –, Jan.–Dec.

CERATOPHYLLACEAE

Ceratophyllum demersum L.; 5, H, common, –, July–Oct.

CAPPARIDACEAE

Capparis flavicans Kurz; 1, 8; S, common, –, Feb.–Mar., Mar.–May.
C. floribunda Wight; 1, C, common, –, Feb.–Apr., May–June.
C. micrantha DC. ssp. micrantha var. micrantha, 1, 8; T/S, very common, –, Dec.–Agr., May–July.
C. zeylanica L.; 1, C, not common, –, Feb.–Apr., May–June.
Cleome viscosa L.; 8, H, common, –, May–Sept.
Crateva adansoni DC, ssp., trifoliata (Roxb.) Jac.; 2, DT, rare, –, Mar.–Apr., July–Aug., April–Jan.
Maerua siamensis (Kurz) Pax; 1, 8; T, not common, –, Jan.–Mar., Feb.–May, Apr.–Jan.

FLACOURTIACEAE

Casearia flexuosa Craib; 1, S, not common, –, Mar.–Apr.
C. graveolens Dalz.; 2, DT, not common, –, Feb.–Mar., Mar.–May, Apr.–Dec.
Flacourtia indica (Burm.f.) Merr.; 8, E/DT, common, –, Jan.–Mar., Mar.–May, Feb.–Dec.

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* There is a strong possibility that three species of *Tinospora* are present.

Homalium dasyanthum (Turcz.) Warb.; 2, DT, not common, –, Mar.–Apr., Apr.–June, Apr.–Jan.
H. tomentosum (Vent.) Benth.; 2, DT, not common, –, June–Aug., Sept–Oct., Apr.–Jan.
Hydnocarpus ilicifolia King; 1, ET, very common, +, Jan.–Mar., Mar.–May

POLYGALACEAE

Polygala glomerata Lour.; 1, H, not common, –, May–July.
Salomonia cantoniensis Lour.; 4, 6; H, common, –, July–Sept.

XANTHOPHYLLACEAE

Xanthophyllum flavescens Roxb. (X. siamense Craib, X. siamense Craib var. viride Craib, X. excelsum (Bl.) Miq.); 1, T, not common, –, Mar.–Apr., May–June.
X. lanceatum (Miq.) J.J. Sm. (X. glaucum Wall. ex Hassk.); 1, T, not common, –, Feb.–Mar., May–June.

PORTULACACEAE

Portulaca oleracea L.; 8, H, comon, –, Jan.–Dec.

HYPERICACEAE

Cratoxylum formosum (Jack) Dyer; 2, DT, common, –, Apr.–May, June–July, Mar.–Dec.
C. cochinchinensis (Lour.) Bl., 2, DT, very common, –, Dec.–Jan., Feb.–Apr., Mar.–Dec.
C. prunifolium Dyer; 2, DT, not common, –, Jan.–Feb., Mar.–May, Mar.–Dec.

GUTTIFERAE

Garcinia cowa Roxb.; 1, T, not common, –, Feb.–Mar., June–July.
Mammea siamensis (Miq.) T. And.; 1, 2; T, not common, –, Feb.–Mar., July–Aug.

DIPTEROCARPACEAE

Dipterocarpus alatus Roxb.; 1, 9; T, not common, –, Jan.–Mar., Apr.–May.
Pentacme suavis A. DC. var. siamensis (Miq.) Smit.; 2, DT, not common, –, Jan.–Mar., Feb.–May, Feb.–Dec.
Shorea sericeiflora Fisch. & Hut.; 1, T, not common, +, Dec.–Feb., Feb.–Mar.

ANCISTROCLADACEAE

Ancistrocladus tectorius (Lour.) Merr.; 1, C, common, –, Jan.–Feb., Feb.–Mar.

MALVACEAE

Abutilon indicum (L.) Sweet; 8, H, common, –, Feb.–Nov., Mar.–Dec.
Hibiscus macrophyllus Roxb.; 1, 8,T, not common, –, Jan.–Mar., Feb.–Apr.
H. surattensis L.; 8, H, common, –, Nov.–Jan.
Sida rhombifolia L.; 8, H, common, –, June–Nov.

Sida veronicaefolia Lmk ; 8, H, not common, –, Aug.–Nov.
Thespesia lampas (Cav.) Dalz. & Gibs.; 2, DH/DS, not common, –, Oct. – Dec., leaves May–Dec.
Urena lobata L.; 8, H/S, very common, –, Oct.–Dec.

BOMBACACEAE

Bombax anceps Pierre var. cambodiense (Pierre) A. Robyn; 2, DT, common, –, Dec.–Feb., Mar.–Apr., leaves Apr.–Nov.
B. malabaricum DC.; 2, DT, very common, –, Jan.–Feb., Mar.–Apr., leaves Apr.–Dec.

STERCULIACEAE

Eriolaena candollei Wall.; 2, DT, rare, – , Apr.–May, May–July, Apr.–Dec.
*Firmiana colorata (Roxb.) R. Br.; 2, DT, not common (rare?),–, Mar.–Apr., fruit ?, leaves May–Jan.
Helecteres elongata Wall. ex. Boj.; 1, 2; S, not common, +, July–Sept., Aug.–Oct.
H. hirsuta Lour.; 1, S/H, very common, –, Sept.–Dec., Oct.–Jan.
Melochia corchorifolia L. ; 8, H, common, –, June–Sept.
Pterocymbium tinctorium (Blanco) Merr. var. javanicum (R. Br.) Kost.; 2, DT, very common, –, Mar.–Apr., leaves May–Dec.
Pterospermum diversifolium Bl. (P. grandiflorum Craib); 1, T, common, –, Mar.–May, July–Nov.
P. littorale Craib; 6, 1; T, not common, –, Mar.–May, July–Nov.
P. semisagittatum Ham. ex Roxb.; 1, T, very common, –, May–July, Sept.–Dec.
P. venustum Craib; 1, T, not common, –, Mar.–May, July–Nov.
Sterculia angustifolia Roxb. ex Jack; 2, DT, not common, –, Mar.–Apr., Apr.–May, leaves Feb.–Dec.
S. longifolia Vent.; 2, DT, not common, –, Feb.–Mar., June–July, Jan.–Nov. *(NEW RECORD ?).*
S. (probably) hypochra Pierre; 2, 6, DT; rare, only leaves Jan.–Nov.

TILIACEAE

Colona floribunda (Kurz) Craib; 2, DT, common, –, Aug.–Sept., Oct.–Dec., Mar.–Nov.
C. winitii (Craib) Craib; 2, DT, very common, –, May–June, June–Aug., Feb.–Nov.
Corchorus aestuans L.; 8, H, common, –, July–Sept., Sept.–Nov.
C. capsularis L.; 8, H, common, –, July–Sept., Sept.–Dec.
Grewia glabra Bl.; 1, 8; T, common, –, Aug.–Nov., Sept.–Jan.

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* fruit of this species generally appear 1 or 2 months after flowering, and fruit fall occurs prior to the development of new leaves.

Grewia paniculata Roxb. ; 2, 8, DT/S, very common, + , July–Sept., Aug.–Nov., Feb.–Dec.

G. elatostemoides Coll. & Hems. ; 2, 8, DT, not common, –, Feb.–Mar., Feb.–May, Feb.–Dec.

Pentace burmanica Kurz; 1, T, rare, –, Jan.–Mar., Feb.–May.

Triumfetta rhomboidea Jacq.; 8, H, common, –, Aug.–Nov., Sept.–Dec.

ELAEOCARPACEAE

Elaeocarpus lacunosus Wall. ex Kurz; 1, T, rare, –, May–June, June–July.

MALPIGHIACEAE

Aspidopterys heterocarpa J. Ar.; 1, V, not common, *NEW RECORD*, Mar.–Apr., Apr.–May.

A. sessifolia J. Ar.; 1, 8, V, not common, –, Sept.–Oct., Oct.–Nov.

A. tomentosa (Bl.) Juss. var. obcordata (Hem.) Nied.; 1, V, not common, –, Feb.–Mar., Mar.–Apr.

Hiptage benghalensis (L.) Kurz; 1, C, not common, –, Feb.–Mar., Mar.–Apr.

OXALIDACEAE

Biophytum sensitivum (L.) DC.; 8, H, not common, + , June–Aug.

BALSAMINACEAE

Impatiens patula Craib; 6, H, very common, –, July–Oct.

RUTACEAE

Acronychia laurifolia Bl. ; 1, 8; T, common, –, June–Sept., Aug.–Dec.

Aegle marmelos (L.) Corr.; 2, 8, 9; DT, not common, –, Mar.–May, Nov.–Jan., Mar.–Jan.

Clausena excavata Burm. f.; 1, S, not common, + , Dec.–Feb., Feb.–Apr.

Glycosmis pentaphylla (Retz.) Corr.; 1,6; T, very common, + , Oct.–Jan., Nov.–Mar.

Hesperethusa crenulata (Roxb.) Roem.; 2, DT, not common, –, Feb.–Mar., May–June, Feb.–Dec.

Micromelum hirsutum Oliv.; 1, S, very common, –, Oct.–Dec., Nov.–Jan.

Murraya paniculata (L.) Jack; 1,9; T, common, +, Mar.–Apr., May–July.

Zanthoxylum rhetsa (Roxb.) DC.; 2, DT, common, –, Apr.–May, July–Sept., leaves May–Dec.

SIMAROUBACEAE

Ailanthus triphysa (Denn.) Alst.; 1, not common, –, Jan.–Feb., Mar.–Apr.

Brucea javanica (L.) Merr.; 2,8, DS, common, –, Sept.–Nov., Oct.–Dec., Feb.–Dec.

Eurycoma longifolia Jack; 1, T, common, –, Oct.–Dec.
Harrisonia perforata (Blanco) Merr.; 1,2,8, D/ES, very common, + Mar.–May, May–July, Mar.–Jan.

IRVINGIACEAE

Irvingia malayana Oliv. ex Benn.; 1, T, not common, –, Mar.–May, Nov.–Jan.

OCHNACEAE

Ochna integerrima (Lour.) Merr.; 2, DT, not common, –, Jan.–Feb., Feb.–Mar., Feb.–Dec.

BURSERACEAE

Canarium subulatum Guill.; 2, DT, common, –, Apr.–May, June–July, Apr.–Dec.
Garuga floribunda Decne.; 2 DT, common, –, Feb.–Mar., May–June, Apr.–Dec.

MELIACEAE

Aglaia hoaensis Pierre; 1, T, not common, –, Aug.–Sept., fruit ?.
A. pirifera Hance; 1, T, not common, +, July–Aug., Feb.–Mar.
Amoora polystachya (Wall.) Hk.f. & Jacks.; 1, T, not common, +, July–Sept., Nov.–Jan.
Chukrasia velutina W. & A. ; 2, 1,DT, not common,–, July–Aug., fruit ?, Mar.–Nov.
Dysoxylum cochinchinense Pierre; 1, T, not common, –, Jan.–Apr., June–Aug.
Melia azedarach L.; 2,8, DT, not common, –, Feb.–Apr., May–June, Mar.–Dec.
Sandoricum koetjape (Burm.f.) Merr.; 1, T, common, –, Feb.–Apr., May–June.
Turraea humilis (Blanco) Merr.; 2,8, H, not common, +, Mar.–June, Apr.–July.
Walsura cochinchinensis Harms; 2,1, ET, common, *NEW RECORD,* Sept.–Feb., Oct.–Mar.
W. robusta Roxb.; 1, T, common, –, Nov.–Feb., Mar.–May.

OLACACEAE

Olax scandens Roxb.; 1, 8, C, common, –, Nov.–Dec., Dec.–Jan.

ICACINACEAE

Pyrenacantha volubilis Wight; 1, V, common, –, Dec.–Feb., Apr.–June.

CARDIOPTERIDACEAE

Cardiopteris javanica Bl.; 1, 2, 8; V, common, –, Sept.–Nov.

AQUIFOLIACEAE

Ilex umbellulata Loesn.; 1, T, not common, –, Feb.–Mar., fruit ?

CELASTRACEAE

Reissantia indica (Willd.) Halle; 1, C, very common, –, Nov.–Feb., Nov.–Jan.
Salacia chinensis L.; 1, S, common, –, Jan.–Mar., Mar.–May.
S. verrucosa Wight, 1, C, common, –, Jan.–Mar., Apr.–June.
Sphonodon celastrineus Griff.; 2, T, rare, –, Aug.–Sept., Dec.–June.

RHAMNACEAE

Colubrina pubescens Kurz; 8, S, common, –, Nov.–Jan.

Gouania obtusifolia Vent. ex Brong.; 1, 8, C, very common, +, Oct.–Nov., Nov.–Dec.

Ventilago cristata Pierre; 1, C, common, +, Dec.–Jan., Feb.–Mar.

Zizyphus cambodiana Pierre; 2, DS, not common, +, Feb.–Apr., Aug.–Sept. Feb.–Dec.

Z. oenoplia (L.) Mill.; 8, C, very common, +, Oct.–Dec., Dec.–Feb.

LEEACEAE

Leea macrophylla Roxb. ex Horn.; 8, 9, H, not common, –, Sept.–Nov., Oct.–Dec., (leaves variable).

L. setuligera C.B. Cl.; 3, H,S; rare,–, June–July, July–Aug.

L. indica (Burm.f.) Merr.; 1, S, not common, –, June–July, July–Aug.

VITACEAE

Ampelocissus harmandii Pl.; 2, DV, not common, *NEW RECORD*, Mar.–Apr., Apr.–May, Apr.–Dec.

A. martinii Pl.; 1, V, common, –, Apr.–May, June–Aug.

Cayratia japonica (Thunb.) Gagnep.; 8, V, not common, –, June–July, July–Aug.

C. pedata (Lour.) Juss.; 1,8, V, common, –, June–July, Aug.–Sept.

C. tenuifolia (W. & A.) Gagnep.; 8, V, common, –, July–Aug., Aug.–Sept.

C. trifolia (L.); Dom.; 8, V, common, –, May–June, June–July.

Cissus adnata Roxb.; 1,8, V, common, –, June–July, July–Aug.

C. craibii Gagnep. apud Craib var. dissecta (Craib) Gagnep.; 2,3; V, not common, –, June–July, July–Aug.

C. modeccoides Planch.; 2, 3, V, not common, –, July–Aug., Aug.–Sept.

C. nodosa Bl.; 8, V, common, *NEW RECORD*, Nov.–Dec.

C. repens Lmk.; 1,8, V, common, –, Oct.–Nov.

Tetrastigma crassipes Planch.; 1,6, V, common, –, Dec.–Jan., Sept.–Oct.

T. harmandii Planch.; 1,6, V, common, +, Dec.–Feb., Oct.–Dec. *(NEW RECORD ?)*.

SAPINDACEAE

Allophylus cobbe (L.) Raeus.; 1, T, common, +, May–July, Aug.–Sept.

A. montanus Will.; 2,1, V, not common, +, June–July, Aug.–Sept.

Arfeuillea arborescens Pierre; 2, DT, common,–, Nov.–Dec., Dec.–Mar., Dec.–Nov.

Lepisanthes rubiginosa (Roxb.) Leenh.; 1, T, very common, –, Feb.–Apr., May–June.

L. senegalensis (Poir.) Lmk.; 8, S, common, –, Jan.–Mar., Mar.–May.

Mischocarpus sundaicus Bl.; 1, T, not common, –, May–July, Aug.–Oct.

Nephelium hypoleucum Kurz; 1, T, not common, +, Jan.–Feb., Mar.–Apr.

Schleichera oleosa (Lour.) Oken.; 2, DT, not common, –, Jan.–Feb., Mar.–May, Feb.–Dec.

Zollingeria dongnaiensis Pierre; 2, DT, not common, –, Dec.–Jan., Jan.–Feb., Feb.–Dec.

ANACARDIACEAE

Lannea coromandelica (Houtt.) Merr.; 2, DT, common, –, Jan.–Feb., Feb.–Mar., May–Dec.

Mangifera duperreana Pierre; 1, 9, T, common, –, Jan.–Feb., June–July.

Semecarpus cochinchinensis Engl.; 2, DT, not common, –, Nov.–Dec., Feb.–Mar., Apr.–Dec.

Spondias bipinnata A.-S. & Form.; 2, DT, common, –, Mar.–Apr., June–July, May–Dec.

S. pinnata (L.f.) Kurz; 2, DT, very common, –, Dec.–Jan., Mar.–May, May–Dec.

CONNARACEAE

Cnestis palala (Lour.) Merr. 1, C, not common, –, Dec.–Feb., Mar.–Apr.

Connarus cochinchinensis (Baill.) Pierre; 1,6, C, common, –, Feb.–Apr., Oct–Dec.

Roureopsis stenopetala (Griff.) Schell.; 1,6, C, common, –, Mar.–Apr., May–June.

LEGUMINOSAE

Abrus pulchellus Wall.; 1,8, V, common, –, Sept.–Nov., Oct.–Dec.

Acacia concinna DC.; 1,8, C, common, –, Sept.–Nov., Oct.–Dec.

A. pennata (L.) Willd.; 8, C, very common, –, Jan.–Apr., Feb.–May.

Adenanthera microsperma Teij. & Binn.; 2, DT, not common, –, Mar.–Apr., June–Aug., Apr.–Jan.

Aeschynomene americana L.; 8, 4; H, common, –, Oct.–Dec.

Afzelia xylocarpa (Kurz) Craib; 2,1, DT/ET; very common, –, Dec.–Feb., Oct.–Jan., Feb.–Dec.

Albizia lebbekoides (DC.) Benth.; 2,8, DT, not common, –, Sept.–Oct., Jan.–Mar., Apr.–Feb.

A. procera Benth.; 2,8, DT, very common, –, Oct.–Nov., Nov.–Jan., Apr.–Feb.

Alysicarpus vaginalis (L.) DC.; 8, H, common, –, Aug.–Nov.

Atylosia volubilis Gam.; 8,2; V, not common, +, Nov.–Jan.

Bauhinia bracteata (Grah. ex Benth.) Bak.; 1,8, C, common, –, July–Sept., Nov.–Jan.

B. curtisii Pr.; 1, C, very common, +, July–Aug., Aug.–Sept.

B. saccocalyx Pierre; 1,8, C/T, common, +, Apr.–June, May–Feb.

B. scandens L. var. horsfieldii (Watt. ex Pr.) K. & S. Lar.; 1,8, C, common, +, Sept.–Oct., Nov.–Dec.

Butea monosperma (Lmk.) Taub.; 2, E/DT, not common, –, Mar. –, Apr., Apr.–May, Apr.–Dec.

Butea superba Roxb.; 2, DC, common, –, Jan.–Feb., Mar.–May, May.–Dec.
Caesalpinia digyna Rottl.; 1, C, common, –, June–July, Nov.–Jan.
C. hymenocarpa (Pr.) Hatt. (*Mezoneuron hymenocarpum* Hk.f. & Jack.); 1,8 C, not common, –, Aug.–Sept., Oct.–Nov.
Calopogonium mucunoides Desv.; 8, V, common, –, Oct.–Nov.
Canavalia virosa W. & A.; 8, V, common, –, Oct.–Dec., Nov.–Jan.
Cassia alata L.; 6,8, S, not common, –, Nov.–Feb.
C. fistula L.; 2, 8,9, DT, not common., –, June–Aug, Oct.–Jan., Mar.–Dec.
C. garrettiana Craib; 2,8, DT, common, +, Oct.–Dec., Nov.–Jan., Apr.–Jan.
C. mimosoides L.; 8, 4, H, common, –, Oct.–Dec.
C. occidentalis L.; 8, H, common, –, Aug.–Nov.
C. pumila Lmk.; 8, H, common, –, Aug–Oct.
C. timoriensis DC.; 8, T, common, –, Oct.–Dec.
C. tora L.; 8, H, common, +, Aug.–Oct.
Centrosema pubescens Benth.; 8, V, not common, –, July–Sept., Aug.–Dec.
Christia vespertilionis (L.f.) Bakh.f.; 2,1, H, very common, –, Nov.–Jan.
Crotalaria chinensis L.; 8, H, common, –, Oct.–Dec.
C. mucronata Desv.; 8, H, common, –, Aug.–Sept., Sept.–Nov.
C. quinquefolia L.; 6,3, H, not common, –, Sept.–Nov.
C. verrucosa L.; 8, H, not common, +, Aug–Oct., Oct.–Nov.
Dalbergia cochinchinensis Pierre ex Lanes.; 1,2,8, DT/ET, very common, –, July–Dec., Oct.–Feb., Mar.–Dec.
D. cultrata Grah. ex Benth. (*D. fusca* Pierre); 2, DT, not common, –, Jan.–Feb., Apr.–June, Feb.–Dec.
D. discolor Bl. ex Miq.; 1,8, C/T, common, –, Aug.–Sept., Oct.–Dec.
D. ovata Grah. (*D. foliacea* Craib); 2, DT, not common, –, Dec.–Jan., Feb.–Mar., Apr.–Feb.
D. pierreana Pr. (*D. abbreviata* Craib); 2, DC, not common, –, Jan.–Feb., Feb.–Mar., Apr.–Dec.
D. velutina Benth.; 2, DC, not common, –, Jan.–Mar., Feb.–Apr., Feb.–Dec.
D. volubilis Roxb.; 1,8, C, not common, –, Jan.–Mar., Feb.–Apr.
Derris scandens Benth.; 1,8, C, common, +, Sept.–Nov., Oct.–Dec.
D. thrysiflora Benth. (*D. wallichii* Pr.); 1,6, C, not common, –, Oct.–Nov., Nov.–Dec.
Desmodium gangeticum (L.) DC.; 1, H, common, –, Oct.–Dec.
D. heterocarpon (L.) DC. var. birmanicum (Watt ex Pr.) Ohas.; 1,2, H, common, –, Oct.–Dec.
D. heterocarpon (L.) DC. var. strigosum van Meeu.; 8, H, common, –, Oct.–Dec.
D. heterophyllum (Willd.) DC.; 8, H, common, –, Sept.–Nov.
D. kingianum Pr.; 2,3, S, not common, +, Aug.–Oct., Nov.–Jan.
D. laxiflorum DC.; 1, H, common, –, Oct.–Nov., Nov.–Dec.

Desmodium obcordatum (Miq.) Kurz; 1,2, H, common, –, Oct.–Nov., Nov.–Jan.
D. pulchellum Benth.; ,1, 2, H, common, +, Oct.–Nov., Nov.–Jan.
D. thorelii Gagnep.; 2, 3, 8, S, not common, –, Aug.–Sept., Oct.–Dec.
D. triangulare (Retz.) Merr.; 1,2, H, common, +, Oct.–Nov., Nov.–Jan.
D. triquetrum DC.; 1, 8, H, common, +, Oct.–Nov.
Dialium cochinchinense Pierre; 2, 1, DT/ET, common, –, Mar.–Apr.,
Aug.–Oct., Feb.–Dec.
Dolichos subcarnosus Pr.; 8, V, common, –, Jan.–Feb.
Dunbaria scortechinii Pr.; 1,8, V, common, –, Oct.–Nov.
Entada glandulosa Pierre ex Gagnep.; 8, V, very common, –, Oct.–Nov.
E. phaseoloides (L.) Merr.; 1,2,6, DC/EC, common, –, Apr.–May, July–Feb.,
Apr.–Dec.
Eriosema chinense Vog.; 2, 8, H, not common, +, June–July.
Erythrina stricta Roxb.; 2, DT, very common, –, Dec.–Feb., Feb.–Apr., Apr.–Nov.
Indigofera trifoliata L.; 8, H, common, +, Sept.–Nov.
Mecopus nidulans Benn.; 2, H, common, –, Oct.–Dec.
Millettia pendula Benth. (*M. buteoides* Gagnep. var. *siamensis* Craib, *M. latifolia*) ;
6,2; DT, not common, +, Feb.–Apr., Apr.–Jan., Feb.–Dec.
M. pubinervis Kurz; (*M. hemsleyana* Pr.); 6, 1, T, not common, –, Feb.–Aug.,
Aug.–Dec.
M. racemosa Benth.; 1,2, C, common, –, July–Aug., Nov.–Jan.
Mimosa invisa Mart. ex Colla; 8, H, common, –, Oct.–Feb., Nov.–Mar.
M. pudica L.; 8, H, common, –, May–Dec., July–Feb.
Mucuna interrupta Gagnep. (*M. nigricans* (Lour.) Steud. var. *cordata* Craib);
1,8 V, common, +, July–Aug., Oct.–Dec.
M. pruriens DC.; 8, V, common, –, Oct.–Dec.
Pachyrhizus erosus Urb.; 8, V, common, –, Oct.–Dec.
Parkia streptocarpa Hance; 2, DT, common, –, Mar.–Apr., Apr.–June, Mar.–Dec.
Peltophorum dasyrachis Kurz; 2, DT, common, –, Mar.–May, Apr.–July,
Mar.–Dec.
Phaseolus calcaratus Roxb.; 1,6, H, common, +, Oct.–Dec.
P. lathyroides L.; 8, H, common, –, July–Nov.
Psophocarpus tetragonolobus (L.) DC.; 8, 9, V, not common, –, Aug.–Sept.,
Sept.–Nov.
Pterocarpus macrocarpus Kurz; 2,8, DT, common, –, Apr.–July, June–Aug.,
Mar.–Dec.
Pterolobium schmidtianum Harm.; 1, C, common, –, Nov.–Dec., Dec.–Jan.
Pueraria phaseoloides Benth.; 8, V, common, +, Oct.–Dec.
Pycnospora lutescens (Poir.) Schindl.; 1,8, H, common, –, Oct.–Dec.
Rhynchosia minima DC.; 8, V, not common, +, Oct.–Dec.

Sesbania javanica Miq.; 4,5,6, H, common, –, Aug.–Oct., Oct.–Dec.
Sindora maritima Pierre; 1, T, not common, –, Mar.–May, May–July.
Spatholobus parviflorus O.K.; 1,8, C, not common, –, July–Sept., Nov.–Feb.
Stylosanthes fruticosa (Retz.) Alst.; 8, H, not common, –, Oct.–Dec.
Tephrosia pumila (Lmk.) Pers.; (*T. purpurea* Pers. var. *ciliata* Craib) ; 8, H, not common, –, Sept.–Oct., Oct.–Nov.
T. wallichii Grah. ex Fawc. & Rend.; 8, H, not common, +, June–July, July–Aug.
Teramnus oxyphylla Kurz; 8, H, common, –, Oct.–Dec.
Uraria hamosa Wall. ex W. & A.; 8, H, common, –, Oct.–Dec.
Urariopsis cordifolia (Wall.) Schindl.; 1, H, not common, –, Aug.–Oct.
Xylia kerrii Craib; 2, DT, not common, –, Jan.–Feb., Oct.–Dec., Feb.–Dec.
Zornia diphylla (L.) Pers. ; 8, H, not common, –, Sept.–Nov.

ROSACEAE

Parinari anamense Hance; 1, T, not common, Feb.–Apr., July–Sept.

HALORAGACEAE

Myriophyllum tetrandrum Roxb.; 5, H, rare, –, Nov.–Dec.

COMBRETACEAE

Anogeissus acuminata (Roxb. ex DC.) Guill. & Perr.; 2,1; T, not common, –, Jan.–Feb., Feb.–Mar.
Calycopteris floribunda (Roxb.) Lmk.; 1, C, common, –, Jan.–Feb., Mar.–May.
Combretum latifolium Bl.; 1, C, common, –, Dec.–Jan., Mar.–Apr.
C. pilosum Roxb.; 1, C, not common, –, Jan.–Feb., Mar.–Apr.
C. quadrangulare Kurz; 8, T, not common, –, Mar.–May, Oct.–Jan.
Terminalia bellirica (Gaertn.) Roxb.; 2, DT, common, –, Feb.–Apr., Oct.–Dec. Feb.–Dec.
T. calamansanai (Blanco) Rolfe; 2, DT, very common, –, Oct.–Nov., Nov.–Dec. (fruit variable), Feb.–Dec.
T. darfeuillana Pierre ex Lanes. (probably includes *T. pierrei* Gagnep.); 2, DT, very common, –, Dec.–Jan., Feb.–Apr., Feb.–Dec.
T. triptera Stapf; 2, DT, common, +, July–Aug., Aug.–Sept., Feb.–Dec.

LECYTHIDACEAE

Careya arborea Roxb.; 2, DT, not common, –, Jan.–Feb.; Mar.–Apr., Apr.–Feb.

MELASTOMATACEAE

Melastoma acutisepalum Geddes; ,7,1 (cliffs); S, rare, –, July–Aug., Aug.–Oct.
M. orientale Guill.; 4, S, not common, –, Oct.–Dec., Nov.–Jan.
Memecylon celastrinum Kurz; 1, T., rare, –, May–June, July–Aug.
M. edule Roxb. aff. var. ovatum (J.E. Sm.) C.B. Cl. and aff. var. scutellatum (Naud.) C. B. Cl.; 1,7 (cliffs); T, not common, –, Feb.–June, Apr.–July.

Memecylon floribundum Bl.; 1, T/S, common, +, Sept.–Nov., Dec.–Feb.
M. ovatum Sm.; 1,2, T/S, common, +, Apr.–May, May–July.
M. pauciflorum Bl.; 1, T/S, not common, –, May–June, July–Aug.
Osbeckia chinensis L.; 4,8, H, (very variable in size), common, –, Oct.–Nov.
Phyllagathis hispida King; 6, H, rare, –, May–June, Aug.–Oct.
Sonerila tenera Royle. (*S. nisbetiana* Craib); 6, H, common, –, Sept.–Nov.

LYTHRACEAE

Ammannia baccifera L.; 8, H, very common, +, June–Sept.
Lagerstroemia collinsae Craib; 2, DT, not common, –, June–July, Aug.–Sept., Apr.–Feb.
L. duperreana Pierre ex Gagn.; 2, DT, very common, –, June–July, July–Aug., Apr.–Dec.
L. floribunda Jack var. floribunda; 1,8,9, T, common, –, Nov.–Dec., Dec.–Jan.
L. macrocarpa Wall.; 1, T, not common, –, Apr.–June, July–Sept.
L. subangulata (Craib) Furt. & Mont.; 2, DT, common, +, May–July, Sept.–Sept.–Nov., Apr.–Dec.
Rotala indica Koeh.; 4, H, common, +, Nov.–Dec.

CRYPTERONIACEAE

Crypteronia paniculata Bl.; 1,8, T, not common, –, Dec.–Feb., Feb.–Mar.

ONAGRACEAE

Jussiaea linifolia Vahl; 4,8, H, common, + , Aug.–Sept., Sept.–Dec.
J. repens L.; 4,8, H, common, +, Aug.–Nov.
J. suffruticosa L.; 4,8, H, common, +, Aug.–Dec.
Ludwigia parviflora Roxb.; 8, H, not common, –, Sept.–Dec.

PASSIFLORACEAE

Passiflora foetida L.; 8, V, common, –, June–Oct.

CUCURBITACEAE

Alsomitra angustipetala (Craib) Craib; 2, V, not common, –, Aug.–Oct., fruit?
A. sarcophylla (Wall.) Roem.; 2,3,6, V, very common, –, Oct.–Jan., Jan.–Mar.
Coccinia indica W. & A.; 8, V, common, –, June–Oct.
Luffa aegyptiaca Mill.; 8, V, common, –, Oct.–Dec.
Melothria heterophylla (Lour.) Cogn.; 3,8, V, –, not common, May–June, fruit?
M. maderaspatana (L.) Cogn. (*Mukia maderaspatana* (L.) M.J. Roem.); 8, V, common, +, Oct.–Dec., Nov.–Jan.
M. zeylanica C.B. Cl.; 1,6, V, common, –, June–Oct., Aug.–Nov.
Momordica cochinchinensis (Lour.) Spreng.; 8, V, common, –, May–July.
Trichosanthes integrifolia Kurz; 8, V, common, –, June–Oct., Aug.–Nov.
T. quinqueangulata A. Gr.; 8, V, very common, –, May–Sept., July–Nov.

Trichosanthes rubiflos Thor. ex Cay.; 8, V, common, –, May–Sept., July–Nov. (leaves variable).

T. aff. wallichiana Wight; 2, V, not common, –, veg. only.

Zanonia indica L.; 6, V, common, –, Sept.–Nov., Nov.–Jan.

BEGONIACEAE

Begonia integrifolia Dalz. (*B. debilis* King var. *punicea* Craib); 2,3,1, H, common, +, June–Oct., July–Oct.

TETRAMELIACEAE

Tetrameles nudiflora R. Br.; 2, DT, common, –, Mar.–Apr., Apr.–June, May–Dec.

AIZOACEAE

Glinus oppostifolius A. DC.; 8, H, common, –, July–Sept.

Mollugo pentaphylla L.; 8, H, common, –, July–Sept.

ARALIACEAE

Schefflera elliptica (Bl.) Harm.; 1,6, C, not common, –, Jan.–Feb., Feb.–Apr.

ALANGIACEAE

Alangium salvifolium (L.f.) Wang. ssp. hexapetalum (Lmk.) Wang.; 2,8, DT, not common, –, Mar.–Apr., Apr.–May, May–Dec.

RUBIACEAE

Adina polycephala Benth. (*A. parvula* Geddes); 1, T, not common, –, Jan.–Mar., Feb.–May.

Anthocephalus chinensis (Lmk.) Rich. ex Walp.; 1, T, not common,–, Sept.–Oct. Oct.–Nov.

Argostemma tavoyanum Wall. (*A. albovenatum* Geddes, *A. craibianum* Geddes, *A. plumbeum* Craib, *A. plumbeum* Craib var. *obtusum* Craib, *A. umbellatum* Geddes, *A. umbellatum* Geddes var. *australe* Craib); 6, H, not common, –, June–Aug.

Borreria laevis (Lmk.) Griseb.; 8, H, common, –, Oct.–Dec.

Canthium umbellatum Wight; 1, T, common, –, Mar.–Apr., July–Aug.

Chassalia ophioxyloides (Wall.) Craib; 1, S, common, –, Mar.–Apr., May–July.

Coptosapelta tomentosa (Bl.) Val. ex Heyne.; 1, C, not common, –, Aug. –Sept., fruit?

Gardenia cambodiana Pierre ex Pit. (*G. magifica* Geddes), 2, DT/DS, rare, +, Mar.–Apr., July–Sept., Mar.–Dec.

G. coronaria Ham.; 2, DT, rare, –, Feb.–Mar., May–June, Mar.–Dec.

Geophila herbacea (L.) O.K.; 1, H, common, +, June–Aug., July–Sept.

Hedyotis gracilipes (Craib) Fuk.; 4, H, common, –, Oct.–Nov., Nov.–Dec.

H. nodiflora Wall. ex G. Don; 8, H, not common, –, Sept.–Nov.

H. ovatifolia Cav.; 1, H, common, +, May–Aug.

Hedyotis pterita Bl.; 1,7 (cliffs), H, not common, –, Aug.–Sept.

H. verticillata (L.) Lmk.; 8, H, common, –, Sept.–Nov.

H. sp. 1,7, (cliffs); H, not common, –, Sept.–Nov. (for a detailed discussion see MAXWELL, 1975).

Hymenodictyon excelsum (Roxb.) Wall.; 2, DT, common, +, June–Aug., Sept.–Feb., May–Dec.

Ixora affinis Wall. ex G. Don [includes var. arguta (R. Br. ex King) Craib]; 1, S, common, –, Mar.–Apr., May–July.

I. cibdela Craib; 1, S/T, very common, –, Nov.–Jan., Dec.–Mar.

I. finlaysoniana Wall. ex G. Don; 1, S, not common, –, Jan.–Mar., Feb.–May.

I. javanica (Bl.) DC.; 1, S, very common, –, Jan.–Apr., Mar.–May.

Knoxia corymbosa Willd.; 8, H, common, +, Oct.–Dec.

Lasianthus flavinervis Ridl.; 1, S, not common (rare);–, May–June, June–Aug.

Meyna velutina Roby.; 1, S/T, rare, –, Apr.–June.

Mitracarpum villosum (Sw.) DC.; 8, H, common, *NEW RECORD*, June–Nov.

Mitragyna hirsuta Hav.; 1,7 (cliffs); T, not common, –, Apr.–June, Aug.–Dec.

Morinda cochinchinensis DC.; 1, V, not common, Mar.–Apr., May–June.

M. coreia Ham.; 2, DT, not common, –, Mar.–Apr., May–June, Apr.–Dec.

Mussaenda sanderiana Ridl. (probably includes *M. cambodiana* Pierre ex Pit.); 1, H, not common, –, Dec.–Feb.

M. uniflora Wall. ex G. Don; 8, H, not common, –, Apr.–June.

Ophiorrhiza hispidula Wall. ex G. Don; 1,6; H, not common, +, May–July.

Paederia hirsuta Craib; 1,8, V, very common, +, Aug.–Oct., Oct.–Jan.

P. linearis Hk.f.; 1, 8, V, common, –, Jan.–Feb., Mar.–Apr.

Pavetta indica L. var. hispida Pierre ex Pit. (*P. aspera* Craib, *P. aspera* Craib var. *breviflos* Craib, *P. nervosa* Craib); 1, S, common, –, Nov.–May, July–Sept.

P. tomentosa Roxb., ex Sm. var. canescens (Kurz) Craib; 2, DS, not common, –, May–June, Sept.–Oct., Apr.–Dec.

Prismatomeris malayana Ridl.; 1, S, common, –, Apr.–June, May–July.

Psychotria adenophylla Wall.; 1, S, common, –, Apr.–May, June–July.

P. minutiflora Ridl.; 1, S, not common, –, Apr.–May, May–June.

Randia celastroidea Craib (aff. *R. griffithii* Hk.f.); 1, C/S, not common, –, Apr.–May, May–July.

R. longispina DC.; 2,3, DT, not common, –, Apr.–June, Sept.–Dec., Apr.–Jan.

R. oppositifolia (Roxb.) Wood.; 1, T/S, common, –, Mar.–June, Apr.–Aug.

R. parvula Ridl.; 1, S, common, –, Apr.–June, Aug.–Nov.

R. siamensis (Miq.) Craib (aff. *R. longiflora* Lmk.); 1,8, C, common –, Feb.–Apr., May–July.

R. tomentosa Hk. f.; 2, DT, not common, –, Mar.–Apr., July–Sept., Mar.–Dec.

R. uliginosa Poir.; 2,1, DT/ET, not common, –, Nov.–Jan., Feb.–Mar., Apr.–Dec.

Randia wittii Craib; 2,1, DT/ET, not common, –, Mar.–May, Aug.–Jan., Apr.–Dec.
Tarenna collinsae Craib (*T. vanprukii* Craib, *T. vanprukii* Craib var. *obtusa* Craib, *T. quocensis* Pierre ex Pit.); 1, S/T, common, +, Feb.–May, Apr.–June.
Uncaria homomalla Miq.; 1, C, common, –, Oct.–Dec., Nov.–Jan.

COMPOSITAE

Adenostemma viscosum Forst.; 4,6, H, common, +, Oct.–Dec.
Ageratum conyzoides L.; 8, H, common, –, Dec.–Apr.
Bidens biternata Merr. & Sher.; 4,6, H, common, –, Oct.–Dec.
B. pilosa L.; 8, H, not common, +, June–Sept.
Blumea lacera (Burm.f.) DC.; 1,2, H, common, –, Nov.–Jan. (variable).
B. membranacea DC. var. subsimplex (DC.) Hk.f.; 8, H, common, –, Dec.–Feb.
B. virens DC.; 1,8, H, common, –, Nov.–Feb.
Eclipta prostrata (L.) L.; 8, H, common, +, June–Nov.
Elephantopus scaber L.; 8, H, common, +, Sept.–Dec.
Emilia sonchifolia (L.) DC. ex Wight; 8, H, not common, –, Dec.–Mar.
Erechtites hieracifolia (L.) Rafin. ex DC.; 8, H, common, –, Mar.–May.
Erigeron sumatrensis Retz.; 8, H, common, –, Sept.–Dec.
Eupatorium odoratum L.; 8, H, very common, –, Oct.–Feb.
Gynura pseudochina DC.; 2,3, H, not common, –, Mar.–Apr.
Spilanthes iabadicensis A.H. Moore; 4,6, H, common, +, Oct.–Dec.
Tridax procumbens L.; 8, H, common, –, Jan.–Dec.
Vernonia cinerea (L.) Less.; 8, H, very common, –, Oct.–Feb. (variable).
V. cumingiana Benth.; 1, C, not common, +, probable new record, obsv. in veg. only.
V. elliptica DC.; 1,8, C, not common, –, Feb.–May.

STYLIDIACEAE

Stylidium tenellum Swz.; 4, H, rare, –, Oct.–Nov.

MYRSINACEAE

Ardisia collinsae Flet.; 1,6, S/T, not common, –, Oct.–Dec., Nov.–Feb.
A. colorata Roxb.; 1, S, not common, –, Dec.–Feb., Jan.–Mar.
A. crenata Roxb.; 1, S/T, rare, –, July–Aug., Aug.–Oct.
A. fulva K. & G.; 1, S/T, not common, –, May–June, June–Aug.
A. solanacea Roxb.; 1,6, T/S, not common, –, Dec.–Feb., Jan.–Mar.
A. sp. (74–599), 1, T, not common, –, June–July, fruit?

EBENACEAE

Diospyros buxifolia (Bl.) Hiern.; 1, T, rare, –, veg. only.
D. curranii Merr.; 1,6, T, not common, –, Apr.–June, July–Oct.
D. hermaphroditica (Zoll.) Bakh.; 1, T, common, –, Nov.–Jan., June–Sept.
D. malabarica (Desv.) Kost.; 1, T, common, –, Mar.–May, Nov.–Feb.

Diospyros mollis Griff.; 2, DT, not common, –, Mar.–May, Oct.–Dec, Mar.–Dec.
D. montana Roxb.; 2, DT, not common, +, Mar.–June, Sept.–Dec., Apr.–Dec.
D. rhodocalyx Kurz; 1, T, not common, –, Mar.–May, Oct.–Dec.
D. variegata Kurz; 1, T, not common, –, Mar.–Apr., May–July.

SYMPLOCACEAE

Symplocos racemosa Roxb.; 2, DT, not common, –, Jan.–Mar., Feb.–May, Jan.–Nov.

OLEACEAE

Jasminum anodontum Gagn.; 1,6, V, not common, –, Oct.–Dec., Nov.–Jan.
J. harmandianum Gagnep.; 1, V/C, not common, –, Oct.–Dec., Nov.–Jan.
J. scandens (Retz.) Vahl; 1,8, V/C, very common, –, Dec.–Feb., Jan.–Apr.
Linociera caudata Coll. & Hemsl.; 1,6, T, not common, –, Nov.–Jan., Dec.–Mar.
Myxopyrum smilacifolium (Wall.) Bl.; 1, C, common, –, Jan.–Mar.,
Olea salicifolia Wall. ex G. Don; 1, T, common, –, May–Oct., Aug.–Jan.

APOCYNACEAE

Aganosma harmandiana Pierre ex Spire; 1,8, V, common, +, Apr.–July, Nov.–Jan.
A. marginata (Roxb.) G. Don; 1,8, V, common, –, Mar.–May, Aug.–Oct.
Alstonia scholaris (L.) R. Br.; 1, T, common, –, Dec.–Feb., Feb.–Apr.
Chonemorpha macrophylla (Roxb.) G. Don; 1, C, not common, –, May–July, fruit?
Ervatamia sralensis (Pierre ex Pit.) Kerr [aff. *E. luensis* (Pierre ex Pit.) Kerr]; 1, S, common, –, Mar.–May, Nov.–Jan.
Holarrhena antidysenterica (Roth.) Wall. ex A. DC.; 2, DT, common, –, Jan.–Mar., Sept.–Dec., Apr.–Dec.
Ichnocarpus frutescens (L.) R. Br.; 1, V, common, +, Nov.–Jan., May–Aug.
Nouettea cochinchinensis Pierre; 1, C, common, +, Oct.–Dec., May–July.
Parameria laevigata (Juss.) Mold.; 1, V, common, +, Sept.–Dec., Mar.–June.
Parsonsia penangiana K. & G.; 1, V, not common, +, May–June, fruit?
Rauwolfia serpentina (L.) Benth. ex Kurz; 2, 1, H, rare/not common, May–July.
Strophanthus siamensis Kerr; 1, C/V, not common, –, Feb.–Apr., fruit?
Vallaris solanacea (Roth) O.K.; 1, C, not common, –, Mar.–May, July–Sept.
Willughbeia edulis Roxb. (*W. cochinchinensis* Pierre ex Pit.); 1, C, not common, –, Aug.–Oct., fruit?
Wrightia javanica A. DC.; 9, DT, common, –, May–July, Sept.–Dec., May–Dec.
Xylinbaria minutiflora Pierre; 1,9, V, not common, –, June–Aug., Sept.–Nov.

ASCLEPIADACEAE

Calotropis gigantea (Willd.) Dryand. ex W.T. Ait.; 8,9, S, not common, –, July–Oct., Sept.–Jan.

Campestigma purpurea Pierre ex Cost., 1, V, common, *NEW RECORD*, May–June, July–Sept.

Ceropegia lucida Wall. (aff. *C. siamensis* Kerr); 2, 3, V, not common, –, Oct. –Nov., fruit?

Cynanchum corymbosum Wight; 1, V, not common, –, Oct.–Nov., Jan.–Feb.

Gymnema latifolia Wall. ex Wight; 1, 8, V, not common, –, Oct.–Nov., Dec.–Jan.

G. thorelii Cost; 1, V, not common, *NEW RECORD* May–June, fruit?

Heterostemma siamicum Craib; 1, V, common, +, July–Aug., Sept.–Oct.

Hoya diversifolia Bl. (aff. *H. ovalifolia* W. & A., *H. carnosa* R. Br., *H. graveolens* Kerr), 1, V, common, –, Mar.–May, Apr.–June.

H. kerrii Craib; 2, V, not common, –, Apr.–May, May–June.

H. parasitica (Roxb.) Wall. ex Wight; 1, V, common, –, May–Apr., Apr.–June.

Marsdenia glabra Cost.; 1, 8, V, common, +, May–Oct., July–Jan.

Myriopteron extensum (Wight), K. Sch., 1, V, not common, –, Sept.–Nov., Dec.–Jan.

Raphistemma hooperianum (Bl.) Decne.; 8, V, not common, –, Sept.–Oct., fruit?

Streptocaulon juventas (Lour.) Merr.; 1, 8, V, not common, –, May–July, Oct.–Dec.

Telosma cordata (Burm.f.) Merr.; 1, 8, V, not common, –, Mar.–Apr., Aug.–Oct.

T. minor (Andr.) Craib; 1, V, not common, –, Apr.–June, July–Oct.

Toxocarpus siamensis Schltr.; 1, V, not common, –, Jan.–Mar., fruit?

T. spirei Cost.; 1, V, not common, +, Apr.–May, June–Aug.

T. villosus (Bl.) Decne.; 1,8, V, common, +, Sept.–Dec., Feb.–Apr.

T. aff. griffithii Decne.; and T. ovatus Kerr; 1, V, not common,–, May–June, fruit?

Zygostelma benthami Baill.; 1,2,8, V, not common, –, July–Nov., fruit?

LOGANIACEAE

Cynoctonum mitreola (L.) Britt.; 2,3, H, not common, –, Oct.–Dec.

Strychnos axillaris Colebr.; 1, C, common, –, Feb.–Apr., May–July.

HYDROPHYLLACEAE

Hydrolea zeylanica (L.) Vahl; 4, H, common, –, Oct.–Dec., (flowers blue or white).

BORAGINACEAE

Coldenia procumbens L.; 8, H, common, –, June–Aug.

Cordia cochinchinensis Gagnep.; 1, T, not common, –, Mar.–Apr., May–June.

C. globifera W.W. Sm.; 2, DT, rare –, Mar.–Apr., May–June, Mar.–Dec.

Ehretia laevis Roxb.; 2, DT, not common, –, Mar.–Apr., Apr.–May, Mar.–Dec.

E. timorensis Dcne.; 1, T, not common, –, Nov.–Dec., Jan.–Mar.

Heliotropium indicum L.; 8, H, common, –, May–Oct.

CONVOLVULACEAE

Argyreia capitata (Vahl) Choisy; 1,8, V, common, +, Oct.–Dec., Dec.–Feb.

A. obtecta (Choisy) C.B. Cl.; 1, V, common, +, Oct.–Nov., Nov.–Jan.

Cordisepalum thorelii (Gagnep.) Verdc.; 1, V, not common, +, Nov.–Dec., Dec.–Jan.

Erycibe citriniflora Griff.; 1, C, not common, –, Jan.–Feb., Mar.–Apr.
E. glomerata Bl. ssp. angustifolia (Hall.f.) Hoogl.; 8, C, not common, –, Oct.–Nov., Nov.–Jan.
Hewittia sublobata (L.f.) O.K.; 8, V, common, –, Oct.–Dec.
Ipomoea aquatica Forsk.; 4,5,8, V, common, –, Oct.–Dec., corolla white or or pinkish.
I. digitata L.; 8, 1, V, common, –, May–July, June–Aug.
I. pileata Roxb.; 1, 8, V, common, –, Oct.–Dec.
I. sumatrana (Miq.) v. Oostr.; 1, V, common, –, (flowers and fruit not seen).
I. trichosperma Bl.; 8,1, V, not common, –, Oct.–Dec.
Jacquemontia paniculata (Burm.f.) Hall.f.; 8,9,1, V, common, –, Oct.–Dec.
Merremia gemella (Burm.f.) Hall.f.; 8, V, common, –, Oct.–Dec.
M. hederacea (Burm.f.) Hall.f.; 8, V, common, –, Oct.–Dec.
M. hirta (L.) Merr.; 8, V, common, –, Oct.–Dec.
M. vitifolia (Burm.f.) Hall.f.; 8, V, common, –, Dec.–Mar.
Neuropeltis racemosa Wall.; 1, V/C, not common, –, Nov.–Jan., Jan.–Mar.
Operculina turpethum (L.) S. Manso; 8, V, common, –, Jan.–Apr., Feb.–May.
Porana spectabilis Kurz; 1, V, common, –, Nov.–Jan.

SOLANACEAE

Capsicum frutescens L.; 1, 8,9, H, common, –, June–Aug., July–Nov.
Physalis angulata L.; 8, H, common, –, Sept.–Nov.
P. minima L.; 8, H, common, –, July–Oct.
Solanum ferox L.; 1, H, not common, –, June–Sept.
S. verbascifolium L.; 8,1, T, not common, –, Dec.–Feb.

SCROPHULARIACEAE

Adenosma indianum (Lour.) Merr.; 4,8, H, common, –, Oct.–Dec.
A. microcephalum Hk.f.; 4,8, H, common, –, Oct.–Dec.
Artanema longifolium (L.) Vat.; 4, H, not common, –, July–Sept.
Bacopa floribunda (R. Br.) Wetts.; 4,6,8, H, common, –, Oct.–Dec.
Centranthera cochinchinensis (Lour.) Merr.; 4, H, not common, +, Sept.–Jan.
Limnophila repens (Benth.) Benth.; 4,8, H, common, –, Oct.–Dec.
Lindenbergia philippensis (Cham.) Benth.; 7 (walls); H, not common, –,Jan.–Dec.
Lindernia antipoda (L.) Alst.; 4,8, H, not common, –, July–Sept.
L. ciliata (Colsm.) Penn.; 4,8, H, common, –, July–Sept.
L. crustacea (L.) F. Muell.; 4,8, H, common, –, July–Sept.
L. rugosa (Roth) Merr.; 4,5, H, not common, –, May–Dec.
L. viscosa (Willd.) Merr.; 1,2,7, H, not common, +, June–Oct.
Scoparia dulcis L.; 8, H, very common, +, June–Sept.
Staurogyne glauca (Nees) O.K.; 6,4, H, common, –, Oct.–Dec.

Staurogyne longeciliata Brem.; 1, H, not common, –, Dec.–Feb.
Striga asiatica (L.) O.K.; 8, H, common, –, Oct.–Dec.
Torenia violacea (Aza.) Penn.; 1,4, H, common, –, May–Aug.

OROBANCHACEAE
Aeginetia indica L.; 1,3, PH, very common, –, Sept.–Nov.

LENTIBULARIACEAE
Utricularia aurea Lour.; 5, H, common, –, May–Dec.
U. caerulea L.; 4, H, not common, –, Sept.–Nov. (corolla white).

GESNERIACEAE
Chirita anachoreta Hance; 6, H, rare, –, Sep.–Nov.
Epithema carnosa Benth.; 6,7, H, not common, +, Aug.–Oct.

BIGNONIACEAE
Haplophragma adenophyllum (Wall. ex G. Don) Dop; 2, DT, not common, –, July–Aug., Nov.–Jan., Apr.–Dec.
Markhamia stipulata (Wall.) Seem. var. stipulata; 2, DT, common, –, Nov.–Feb., Jan.–Mar., Apr.–Feb.
Millingtonia hortensis L.f.; 2, DT, not common, –, Oct.–Nov., Dec.–Jan., Apr.–Jan.
Oroxylum indicum (L.) Vent.; 2,8, DT, common, –, July–Oct., Nov.–Jan., Apr.–Dec.
Stereospermum cylindricum Pierre ex Dop; 2, DT not common, –, July–Aug., Oct.–Nov., Mar.–Dec.
S. personatum (Hassk.) Chatt.; 2, DT, common, –, May–July, July–Oct., Apr.–Dec.

THUNBERGIACEAE
Thunbergia grandiflora Roxb.; 8,9, V, very common, +, Oct.–Jan., Dec.–Feb.
T. fragrans Roxb.; 1,2,8, V, common, –, Sept.–Nov., Oct.–Jan.

ACANTHACEAE
Andrographis paniculata (Burm.) Wall. ex Nees; 1, H, common, –, Feb.–May.
Barleria strigosa Willd.; 1, H, common, +, Sept.–Nov.
Dicliptera chinensis Nees (aff. *D. rosea* Ridl.); 1, H, not common, –, Dec.–Mar.
Dipteracanthus repens (L.) Hassk.; 8, H, common, +, Oct.–Dec., Dec.–Jan.
Dyschoriste depressa Nees (= *D. erecta* O. Kun. ?); 1,2, H, common, –, Nov.–Jan.
Gymnostachyum signatum (R. Ben.) Imlay; 1, H, not common, +, Aug.–Sept.
Hygrophila erecta (Burm.) Hochr.; 4,8, H, common, –, Nov.–Jan.
H. incana Nees; 6,8, H, common, –, Nov.–Jan.
H. phlomoides Nees; 8,4, H, common, –, Nov.–Jan.
Lepidagathis incurva Ham. ex D. Don; 6,4, H, common, –, Nov.–Jan.
Pseuderanthemum palatiferum (Wall.) Radlk.; 1, H, very common, –, Nov.–Feb.

Rhinacanthus nasutus (L.) Kurz; 8,4, H, not common, –, Oct.–Jan.
Rostellularia chiengmaiensis Brem. [aff. *R. procumbens* (L.) Nees]; 2,3, H, common, –, June–Dec.
Ruellia hirtella Imlay; 1, H, not common, –, Mar.–May.
R. tuberosa L.; 8, H, common, –, Jan.–Dec.
Rungia parviflora Retz. var. parviflora; 2,3, H, common, –, Dec.–Feb.
R. pectinata (L.) Nees; 2,3, H, not common, –, Sept.–Dec.
Sericocalyx scaber (Nees) Brem.; 1,6, H/S, not common, –, Jan.–Mar.
S. schomburgkii (Craib) Brem.; 1,6, H, not common, –, Jan.–Mar.
Strobilanthes incisus Imlay; 2,3, H, not common, –, Dec.–Jan.

VERBENACEAE

Clerodendrum lloydianum Craib; 1, H/S, not common, +, Nov.–Jan.
C. paniculatum L.; 1,8, H, common, +, Sept.–Nov., Oct.–Dec.
C. schmidtii C. B. Cl.; 1, H/S, common, –, Oct.–Nov., Nov.–Jan.
C. villosum Bl.; 1,8, T/C, not common, –, Jan.–Mar., Feb.–Apr.
Callicarpa candicans (Burm.f.) Hochr.; 1, S/C, not common, –, June–July.
Congea tomentosa Roxb.; var. nivea Munir; 1, V/C, very common, –, Dec.–Jan.
Glossocarya mollis Wall. ex Griff.; 1, C, common, +, Nov.–Dec.
Gmelina asiatica L.; 2,6, S/C, common, –, May–Apr., June–July.
Hymenopyramis brachiata Wall. ex Kurz (*H. siamensis* Craib, *H. cana* Craib, *H. acuminata* Fletch., *H. vesiculosa* Fletch.); 1,2,8, S/C, common, +, Mar.–May, Aug.–Oct.
Premna collinsae Craib; 1, S/C, not common, –, Mar.–Apr., May–June.
P. latifolia Roxb.; 2, DT, not common, –, Apr.–May, June–July, Apr.–Dec.
Sphenodesme ferruginea (Griff.) Briq.; 1, C, common, –, Dec.–Feb., Jan.–Mar.
S. mollis Craib; 1, C, common, +, Nov.–Dec., Dec.–Jan.
S. pentandra Jack; 1, C, common, –, Jan.–Feb., Mar.–Apr.
Stachytarpheta jamaicensis (L.) Vahl; 8, H, common, –, May–Nov.
Vitex canescens Kurz; 2, DT, common, –, Apr.–May, May–July, Feb.–Dec.
V. limonifolia Wall. ex Kurz; 2, DT, very common, –, Nov.–Dec., Dec.–Feb., Feb.–Dec.
V. peduncularis Wall. ex Schauer; 2, DT, not common, –, Feb.–Mar., Apr.–May, Feb.–Dec.
V. pubescens Vahl 2, DT, very common, -, Oct.–Nov., Dec.–Jan., Feb.–Dec.
V. quinata (Lour.) Will. var. puberula Mold.; 1, T, not common, –, July–Aug., Oct.–Dec.

LABIATAE

Anisomeles indica (L.) O.K.; 8, H, common, +, Nov.–Jan.
Gomphostemma javanicum (Bl.) Benth.; 1, H, not common, –, Dec.–Feb.
Hyptis suaveolens (L.) Poit.; 8, H, common, –, Sept.–Nov.
Orthosiphon aristatus (Bl.) Miq.; 1, H, not common, –, June–July.

NYCTAGINACEAE

Boerhavia diffusa L.; 8, H, very common, –, Jan.–Dec.

Pisonia aculeata L.; 1,6, C, common, –, Nov.–Dec., Dec.–Feb.

AMARANTHACEAE

Achyranthes aspera L.; 8, H, common, –, Sept.–Dec.

Alternanthera pungens H.B.K.; 8, H, not common, –, Aug.–Dec.

A. sessilis (L.) R. Br. ex R. & S.; 4,8, H, common, –, Aug.–Nov.

Celosia argentea L.; 8,4, H, common, –, July–Dec.

Deeringia polysperma (Roxb.) Miq.; 1, 6, H/S, not common, –, Nov.–Dec., Dec.–Feb.

Gomphrena celosioides Mart.; 8, H, common, –, Jan.–Dec.

Psilotrichum ferrugineum (Roxb.) Miq.; 1, H, not common, –, June–Oct.

POLYGONACEAE

Polygonum barbatum L.; 4, H, common, +, Oct.–Dec.

ARISTOLOCHIACEAE

Aristolochia roxburghiana Klotz.; 8, V, common, +, Oct.–Nov., Dec.–Jan.

PIPERACEAE

Peperomia pellucida (L.) H.B.K.; 6, H, common, –, Sept.–Dec.

Piper aff. aurantiacum Wall. ex C. DC., P. aff. nigrum L.; 1, V, not common, –, May–July, Sept.–Oct.

P. sp. (Sec. *Eupiper*); 1,6,8, H, not common, –, July–Aug., Aug.–Nov., (Fig. 11).

MYRISTICACEAE

Knema erratica (Hk.f. & Th.) Sincl.; 1, T, not common, –, Dec.–Feb., Jan.–Mar.

K. globularia (Lmk.) Warb.; 1, T, common, –, Nov.–Jan., Mar.–May.

LAURACEAE

Beilschmiedia roxburghiana Nees; 1, T, rare, –, Feb.–Apr., June–Sept.

Cinnamomum iners Reinw. ex Bl.; 1, T, rare, –, Jan.–Feb., Apr.–June.

Litsea glutinosa (Lour.) C.B. Rob.; 1, T, common, –, May–July, Aug.–Sept.

Phoebe tavoyana (Meisn.) Hk.f.; 1, T, rare, –, Jan.–Mar., Feb.–April.

HERNANDIACEAE

Illigera thorelii Gagnep.; 8, V, common, +, Oct.–Nov., Nov.–Dec.

LORANTHACEAE

Dendrophthoe pentandra (L.) Miq.; 1,2,8, PHE., very common, –, Jan.–Dec.

Scurrula atropurpurea (Bl.) Dans.; 1,2,8, PHE, common, –, July,–Dec.

Viscum articulatum Burm.f.; 1,2,8, PHE, not common,–,Jan.–Dec.



Fig. 11. *Piper* sp. (Maxwell 74–745)
A. Staminate plant, natural size
B. Staminate inflor., X 4
C. Peltate bract and unopened anther, X 40
D. Peltate bract and opened anther, X 40

OPILIACEAE

Cansjera rheedii Gmel.; 1,6, C/S, common, –, Nov.–Dec., Jan.–Feb.
* Melientha suavis Pierre, 2, ET, rare, –, Jan.–Mar., fruit?
Urobotrya siamensis Hiep., 2, ES, common, –, Nov.–Jan., Dec.–Apr.

EUPHORBIACEAE

Acalypha lanceolata Willd.; 8, H, common, –, July–Nov.
Alchornea rugosa (Lour.) M.-A.; 1,6, S/T, very common, –, Dec.–Jan., Jan.–Mar.
Aporusa planchoniana Baill. ex M.-A.; 1, T, common, –, Jan.–Feb., Mar.–Apr.
A. yunnanensis (Pax & Hoff.) Metc.; 1, T, not common, +, Dec.–Jan., Feb.–Mar.
Baccaurea ramiflora Lour.; 1,9, T, very common, –, Jan.–Feb., May–June.
Baliospermum montanum (Willd.) M.-A.; 8, H, common, –, Dec.–Feb.
Breynia angustifolia Hk.f.; 2,1, T/S, not common, –, Feb.–Apr., Apr.–June.
B. vitis-idaea (Burm.f.) Fisch.; 1,8, S, not common, –, Oct.–Nov.
Bridelia stipularis (L.) Bl.; 1, C, very common, –, Oct.–Nov., Nov.–Jan.
B. tomentosa Bl.; 1, T, common, –, Sept.–Oct., Nov.–Dec.
Chaetocarpus castanocarpus (Roxb.) Thw.; 1, T, not common, –, Nov.–Jan., Dec.–Mar.
Cladogynos orientalis Zipp. ex Span.; 1, H, very common, +, Oct.–Jan.
Claoxylon indicum (Reinw. ex Bl.) Hassk.; 1, T, common, –, Apr.–May, May–June
Cleistanthus tomentosus Hance; 1, S/T, common, –, Nov.–Dec., Dec.–Feb.
Croton oblongifolius Roxb.; 2, DT, not common, –, Dec.–Jan., Jan.–Mar., Feb.–Dec.
C. robustus Kurz; 1, T, common, –, Nov.–Jan., Jan.–Mar.
Erismanthus sinensis Oliv.; 6, T, not common, –, Mar.–Apr., Apr.–May.
Euphorbia antiquorum L.; 6, 1, S/T, common, –, Jan.–Feb., Mar.–Apr.
E. hirta L.; 8, H, very common, +, May–Sept.
E. heterophylla L.; 8, H, common, –, Jan.–Dec.
E. thymifolia L.; 8, H, not common, –, May–Dec.
Glochidion lanceolarium (Roxb.) Voigt; 2,8, T, not common, –, Feb.–Mar.
Macaranga gigantea (Rchb.f. & Zoll.) M.-A.; 1/8,T, common, –, Dec.–May, Apr.–June.
Mallotus oblongifolius (Miq.) M.-A.; 1, S, very common, July–Nov.
M. paniculatus (Lmk.) M.-A.; 1/8, T, very common, –, Oct.–Nov., Dec.–Jan.
M. philippensis (Lmk.) M.-A.; 1/8, T, common, +, Apr.–May, June.–Aug.
M. repandus (Willd.) M.-A.; 1/8, V/C, common, –, Nov.–Jan., Dec.–Mar.
Pachystylidium hirsutum (Bl.) Pax. & Hoff.; 1, V, common, –, Mar.–May, Aug.–Nov.

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* This species, common in the deciduous forest at Khao Khieo, Si Racha District, Chon Buri Province ; flowers from January to early March, and has fruit from March to May.

Phyllanthus emblica L.; 2,9, DT, common, –, Mar.–June, Oct.–Jan., Apr.–Dec.
P. reticulatus Poir.; 1,8, S/C, common, +, Nov.–Dec., Dec.–Feb.
P. urinaria L.; 8, H, common, –, Jan.–Dec.
P. virgatus Forst. f.; 8, H, common, –, Jan.–Dec.
P. welwitschianus M.-A.; 2, DS, not common, –, June–July, Nov.–Dec., Apr.–Dec.
Sapium insigne (Roy.) Benth.; 2, DT, common, –, Dec.–Jan., Jan.–Mar., Apr.–Dec.
Sauropus androgynus (L.) Merr.; 1,8, S, common, –, Sept.–Nov.
S. brevipes M.-A.; 1, 2, S, not common, –, May–July.
S. quadrangularis (Willd.) M.-A. var. quadrangularis; 2,3, S, not common, –, June–Aug., July–Sept.
Strophioblachia glandulosa Pax var. pandurifolia A. S.; 2,8, H (deciduous perennial) not common, –, Jan.–Sept., Mar.–Dec., Feb.–Dec.
Suregada multiflora (A. Juss.) Baill.; 1, T, not common, +, Mar.Apr., Apr.–May.
Thyrsanthera suborbicularis Pierre ex Gagnep.; 8, H, not common, –, Feb.–Mar., Mar.–May.
Trewia nudiflora L.; 2,6, DT, common, –, Dec.–Feb., July–Oct., Apr.–Dec.

STILAGINACEAE

Antidesma acidum Retz.; 2, DT, common, –, Apr.–May, Sept.–Nov., Feb.–Dec.
A. sootepense Craib; 1, S/T, common, –, May–July, Sept.–Nov.

PANDACEAE

Microdesmis caseariifolia Pl.; 1, T, common, –, Mar.–Apr., May–June.

ULMACEAE

Celtis timorensis Span.; 2,1, DT, not common, –, Mar.–Apr., May–June, Apr.–Dec.
Holoptelea integrifolia (Roxb.) Pl.; 2,1, DT/ET, not common, –, Jan.–Feb., Feb.–Apr., Feb.–Nov.
Trema orientalis (L.) Bl.; 8, T, common, –, Jan.–Dec.

MORACEAE

Antiaris toxicaria Lesch.; 1, T, not common, –, veg. only.
Artocarpus gomeziana Wall. ex Trec.; 1, T, not common, +, Sept.–Oct., Apr.–June.
Broussonetia kurzii (Hk.f.) Corn.; 2,1,8, DC, very common, –, Dec.–Feb., Jan.–Mar., Apr.–Dec.
B. papyrifera (L.) Vent.; 1,8, T, not common, –, Feb.–Apr., Apr.–June.
Ficus altissima Bl.; 1, T, not common, –, Feb.–Apr.
F. annulata Bl. 1, T, not common, +, May–Oct.
F. callosa Willd.; 1, T, not common, –, Dec.–Jan.
F. fistulosa Reinw. ex Bl.; 1,2, ET/DT, not common, –, Apr.–Oct.; variable, leaves Apr.–Mar.
F. globosa Bl.; 1, C, not common, –, Mar.–May.

Ficus hispida L.f.; 8, T, very common, –, Jan.–Dec.
F. microcarpa L.f.; 1,6, T, common, –, Mar.–June.
F. obscura Bl.; 6, C, not common, , June–July.
F. rumphii Bl.; 2,6, DT, not common, –, Jan.–Mar., leaves Mar.–Dec.
F. superba Miq. var superba; 2, DT, not common, –, Mar.–Apr., leaves Apr.–Feb.
F. tinctoria Forst.f.; 1, T, common, –, Oct.–Nov.
F. virens Ait.; 2, DT, not common, –, Dec.–Feb., leaves Mar.–Dec.
Plecospermum andamanicum King; 1, C, not common, –, Dec.–Jan., Feb.–Mar.
Streblus asper Lour. var. asper; 1, T, common, –, Jan.–Feb., Mar.–Apr.
S. taxoides (Heyne) Kurz; 1, S, very common, –, Jan.–Feb., Mar.–Apr.

URTICACEAE

Elatostema repens (Lour.) Merr.; 1,6, H, common, –, July–Aug.
E. surculosum Wight; 1, H, not common, +, May–July.
Laportea interrupta (L.) Chew; 1, H, not common, –, July–Sept.
Poikilospermum suaveolens (Bl.) Merr.; 6, C, common, –, Mar.–Apr., May–June.
Pouzolzia indica Gaud.; 1,6,8, H, not common, +, Apr.–Nov., variable.

Monocotyledones

HYDROCHARITACEAE

Blyxa japonica (Miq.) Maxim. ex Asch. & Gurke; 5, H, common, –, Oct.–Dec.
Hydrilla verticillata (L.f.) Roy.; 5, H, common, –, June–Sept.
Hydrocharis dubia (Bl.) Back.; 5, H, common, –, Oct.–Nov.
Ottelia alismoides (L.) Pers.; 5, H, common, –, Oct.–Dec.

ORCHIDACEAE

Aerides falcatum Lindl.; 1, EO, common, –, May–June, July–Aug.
A. mitratum Rchb.f.; 1,2, EO, noted by Seidenfaden and Smitinand (p.548) to have been collected at Pra Chai Temple area, +, Apr.–May.
Bulbophyllum lepidum (Bl.) J.J.S.; 1,7, EO/RO, not common, –, July–Aug.
B. lobbii Lindl.; 1, EO, not common, –, Dec.–Mar.
Cleisostoma discolor Lindl.; 1, EO, rare, –, June–Aug.
C. paniculatum (Ker–G.) Gar.; 1, EO, rare, –, July–Aug.
Chiloschista luniferus (Rchb.f.) J.J.S.; 1, EO, common, –, Mar.–May.
Coelogyne trinervis Lindl.; 7, RO, rare, –, Oct.–Nov.
Cymbidium simulans Rolfe; 2, EO, not common, –, Apr.–May.
Dendrobium tixieri Guill., 1, EO, not common, –, June–Sept.
D. pulchellum Roxb.; 1, EO, rare, –, Jan.–Feb.
Eulophia andamanensis Rchb.f.; 2,3, GO, rare, +, Mar.–Apr., June–July, leaves May–Dec.

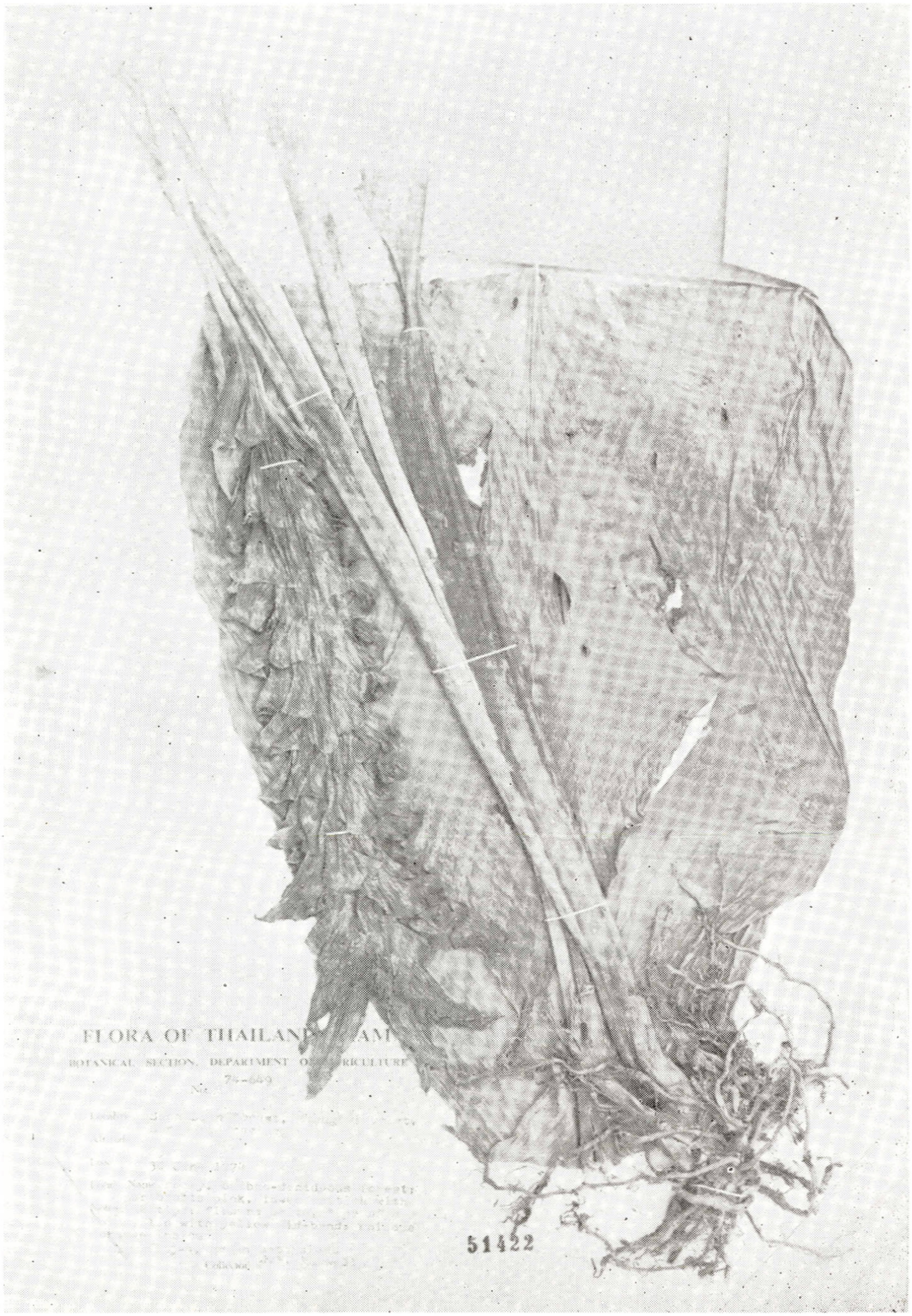
Eulophia graminea Lindl.; 1,8, GO, common, –, Dec.–Jan., Mar.–Apr., leaves Feb.–Nov.
Geodorum purpureum R.Br.; 2,3, GO, common, –, Apr.–June (lip color variable).
Habenaria columbae Ridl., 2,3, GO, not common, +, July–Sept.
H. dentata (Sur.) Schltr.; 2,3, GO, common, +, Sept.–Nov.
H. recurva Rolfe ex Downie; 2,3, GO, not common, –, July–Sept.
Liparis sutepensis Rolfe, ex Downie; 3, GO, rare, –, July–Aug.
Nervilia aragoana Gau.; 3, GO, not common, –, May–June, leaves June–Nov.
Pecteilis sagarikii Seid.; 3, GO, rare, –, Sept.–Oct.
Peristylus goodyeroides Lindl.; 2,3, GO, rare, –, July–Aug.
Rhynchostylis gigantea (Lindl.) Ridl.; 2,1, EO, rare, –, Dec.–Jan., June–July.
Robiquetia spathulata (Bl.) J.J.S.; ,1,2, EO, common, –, Jan.–Mar.
R. succisa (Lindl.) Seid. & Gar.; 1,2, EO, common, +, July–Sept.

ZINGIBERACEAE

Amomum uliginosum Koen.; 1, H, not common, +, May–July, June–Aug.
Boesenbergia longiflora (Wall.) O.K.; 2,3, H, common, –, June–Aug.
B. pandurata (Roxb.) Schltr.; 2,3, H, common, –, June–Aug.
B. sp. 2,3, H, not common, +, June–Aug.
Costus speciosus (Koen.) J.E.Sm.; 1,8, H, common, +, July–Sept.
Curcuma domestica Val.; 2,3, H, common, +, June–Oct. (Fig. 4, Plate I).
C. parviflora Wall.; 3, H, rare, +, June–Aug.
C. sp. 2,3, H, common, –, July–Sept., (Plate II).
Gagnepainia sp., 2,1, H, not common, –, Apr.–May, leaves May–Dec.
Globba albiflora Ridl. var. aurea Holtt.; 1,2, H, common, –, May–July.
G. laeta K. Lar.; 2,3, H, not common, +, June–Aug.
G. macrocarpa Gagnep.; 2,3, H, common, +, June–Aug.
G. schomburgkii Hk.f.; 2,3,1, H, common, +, May–Oct.
G. villosula Gagnep. (*G. obscura* K. Lar.); 2,3, H, not common, +, June–Aug.
G. sp., 1, H, rare, –, July–Aug.
Kaempferia angustifolia Rosc.; 1,6, H, not common, –, Mar.–Apr.
K. pulchra Ridl.; 2,3, H, common, –, Apr.–June.
K. rotunda L.; 2,3, H, common, –, Mar.–Apr., leaves May–Nov.
Scaphochlamys aff. rubromaculata Holtt.; 2,3, 1; H, common, May–Sept., July–Oct.
Zingiber pellitum Gagnep.; 2,1, H, not common, *NEW RECORD*, Aug.–Oct. (Plate III).
Z. rubens Roxb.; 2,3; H, not common, –, June–July, Oct.–Dec.
Z. zerumbet (L.) Sm.; 2,3, H, common, possibly +, June–Aug., Sept.–Oct.
Z. sp. 2,3, H, common, –, June–Aug., Sept.–Oct.

MARANTACEAE

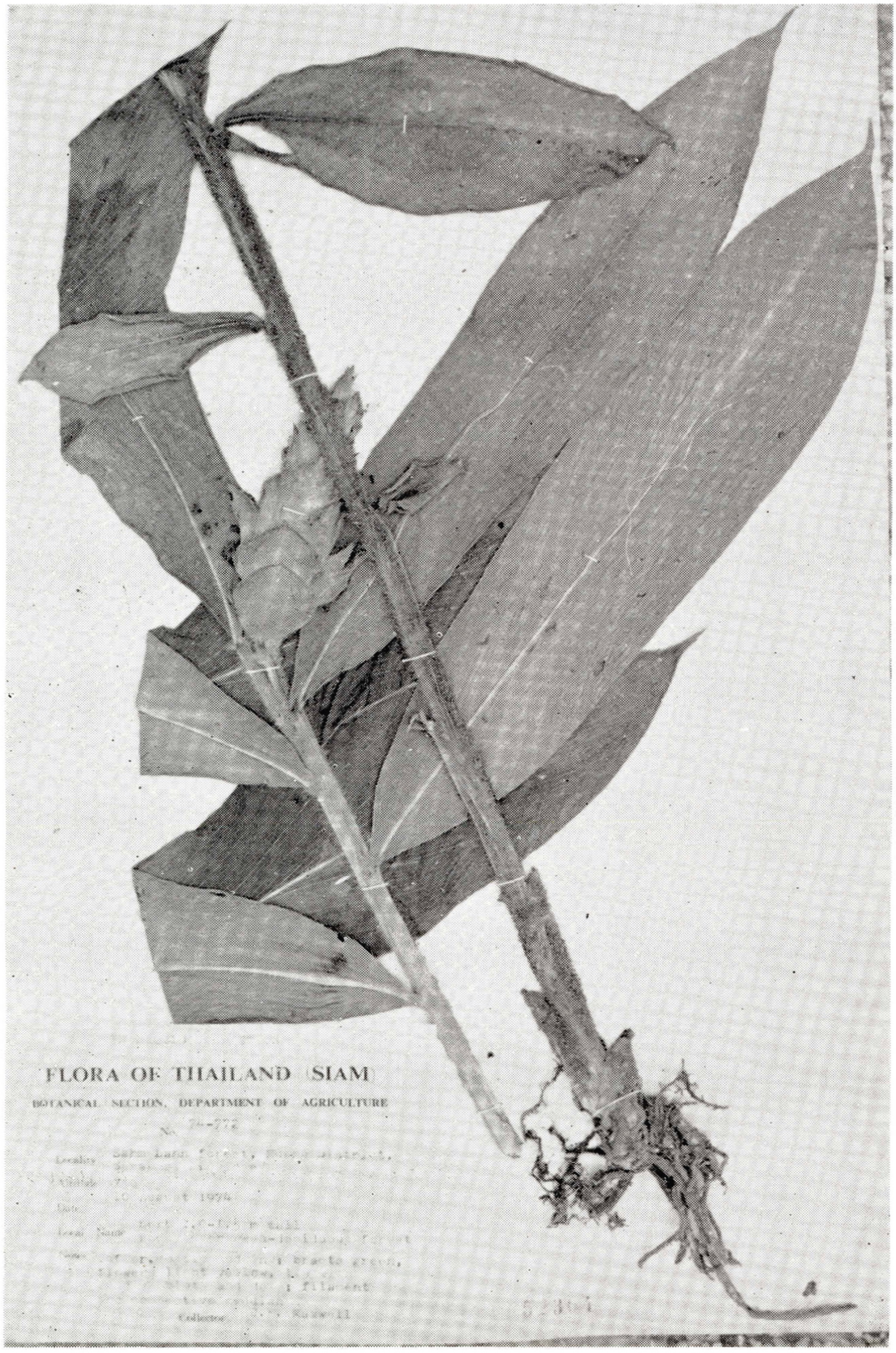
Halopegia blumei K. Sch.; 1,6, H, common, *NEW RECORD*, July–Oct.



Curcuma domestica Val.


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Curcuma sp.



Zingiber pellitum Gagnep.

MUSACEAE

Musa acuminata Colla ssp. siamea Simm.; 1, H, common, –, July–Oct.

HYPOXIDACEAE

Curculigo orchioides Gaertn.; 1, H, common, –, May–July.
Molineria latifolia (Dryan. ex W.T. Ait.) Herb. ex Kurz; 1, H, common, –, May–Oct

AMARYLLIDACEAE

Crinum ensifolium Roxb.; 1,6, H, very common, –, Apr.–May.

TACCACEAE

Tacca leontopetaloides (L.) O.K.; 1,2,3, H, not common, –, Aug.–Oct.

DIOSCOREACEAE

Dioscorea alata L.; 1,8, V, common, +, Aug.–Oct., Sept.–Nov.
D. arachidna Pr. & Burk. var. collinsae (Pr. & Burk.) Pr. & Burk.; 2, V, not common, +, Sept.–Oct., Oct.–Dec.
D. brevipetiolata Pr. & Burk.; 1,2,8, V, not common, July–Sept., Oct.–Nov.
D. bulbifera L.; 1,8, V, very common, +, Aug.–Oct., Sept.–Dec.
D. glabra Roxb. (*D. oryzetorium* Pr. & Burk., *D. stemonoides* Pr. & Burk.) ; 1,8, V, very common, +, Sept.–Nov., Oct.–Dec.
D. hispida Denn. var. reticulata Hk.f.; 2,8, V, common, +, Apr.–May, July–Sept.
D. membranacea Pierre ex Pr. & Bur.; 1,2, V, not common, +, July–Aug., Sept.–Nov.
D. paradoxa Pr. & Burk.; 1, V, not common, +, Oct.–Nov., Nov.–Dec.
D. pentaphylla L.; 1,2,3, V, common, –, Aug.–Oct., Oct.–Dec.
D. pierrei Pr. & Burk.; ,1,2, V, very common, –, Oct.–Nov., Dec.–Feb.

ROXBURGHIACEAE

Stemona collinsae Craib (aff. *S. curtisii* Hk.f., *S. kerrii* Craib); V, common, +, Nov.–Mar., Feb.–Apr., leaves Mar.–Nov.

SMILACACEAE

Smilax luzonensis Presl 1,8, V, common, –, May–July, July–Nov.

LILIACEAE

Chlorophytum orchidastrum Lindl.; 2,3, H, not common, –, May–July.
Gloriosa superba L.; 4,8, V, not common, –, Aug.–Oct.
Peliosanthes violacea Wall. (syn. = *Neolourya pierrei* Rod.); 1,6, H, common, –, Mar.–May, June–Oct.
Urginea indica Kunth; 2,8, H, rare, –, Dec.–Feb., leaves May–Nov.

AGAVACEAE

Dracaena angustifolia Roxb.; 1, S/T, common, –, Jan.–Mar., Mar.–Aug.

PONTEDERIACEAE

Eichhornia crassipes (Mart.) Solms.; 5, H, not common, –, Dec.–Feb.
Monochoria vaginalis (Burm.f.) Presl; 5, H, common, –, Aug.–Nov.

XYRIDACEAE

Xyris lobbii Rend.; 4, H, not common, –, Oct.–Dec.

COMMELINACEAE

Aclisia secundiflora (Bl.) Bakh.f.; 1,8, H, common, –, Sept.–Oct., Oct.–Nov.
Aneilema herbacea (Roxb.) Wall.; 1,8, H, common, –, Apr.–June.
Commelina suffruticosa Bl.; 1,6, H, common, +, Apr.–Oct.
Cyanotis axillaris (L.) D. Don; 1,6, H, common, –, May–Aug.
C. cristata (L.) D. Don; 2,3, H, not common, –, June–Aug.
C. fasciculata Sch.f.; 1,2,7, (cliffs); H, common, –, Aug.–Oct.
C. villosa Sch.f. (aff. *C. zeylanica* Hassk.) ; 4,6, H, not common, +, Sept.–Nov.
Murdannia nudiflora (L.) Brenn.; 1,4,8, H, common, –, May–Aug.

PALMAE

Borassus flabellifer L.; 8,9, T, common, –, Jan.–Dec.
Calamus palustris Griff. var. cochinchinensis Becc.; 1, C, not common, –, Jan.–Feb., fruit?
C. poilanei Conr.; 1, C, not common, –, Jan.–Mar., June–Aug.
C. viminalis Willd.; 1,8, C, common, –, Oct.–Dec., May–July.
Caroyta mitis Lour.; 1,8, T, rare, –, Jan.–Mar., Feb.–Apr.
Didymospermum caudatum Wendl. & Drude.; 1, S, not common, Jan.–Feb., Mar.–May.
Licuala spinosa Thunb.; 4,1, S, not common, –, veg. only.

PANDANACEAE

Pandanus ovatus Warb.; 6,1, H/S, not common, –, June–Aug., Oct.–Dec.

ARACEAE

Aglaonema simplex Bl.; 1, H, common, –, Apr.–June, June–Nov.
Alocasia alba Schott; 4,6, H, common, –, May–July, June–Aug.
Amorphophallus campanulatus Bl. ex Dcne.; 1, H, common, –, Apr.–May, Nov.–Jan., leaves May–Nov.
A. koratensis Gagnep.; 3, H, rare, –, Mar.–Apr., fruit? leaves?
A. longituberosus (Engl.) Engl. & Geh.; 1,2, H, not common, –, Mar.–Apr., June–Aug., leaves Apr.–Dec.
Arisaema cuspidatum (Roxb.) Engl.; 2,3, H, not common, –, May–July, Sept.–Oct.
Colocasia esculenta (L.) Schott; 4,5, H, not common, –, May–Nov.
Pistia straitiotes L.; 5, H, not common, –, Jan.–Dec.
Pothos scandens L.; 1,6, V, not common, –, Aug.–Oct., Dec.–Mar.

Pycnospatha palmata Gagnep.; 3, H, rare, –, possibly, +, Sept.–Oct., fruit?
Scindapsus officinalis (Roxb.) Schott; 1,6, V, common, –, May–July, Oct.–Dec.
Typhonium trilobatum (L.) Schott; 8, H, not common, –, Nov.–Jan., fruit?

LEMNACEAE
Lemna perpusilla Torr.; 5, H, common, –, flowers & fruit?
Spirodela polyrrhiza (L.) Schltr.; 5, H, common, flowers & fruit?

ERIOCAULACEAE
Eriocaulon achiton Koern.; 4, H, not common, –, Aug.–Oct.
E. cinereum R. Br.; 4, H, common, –, Sept.–Nov.
E. xeranthemum Mart.; 4, H, common, –, Sept.–Nov.
E. zollingerianum Koern.; 4, H, not common, –, Sept.–Nov.

CYPERACEAE
Bulbostylis barbata (Rottl.) C.B. Cl.; 1,2, H, not common, –, May–Oc
Carex tricephala Boeck.; 1, H, not common, –, Apr.–July.
Cyperus brevifolius (Rottl.) Hassk.; 8, H, common, –, July–Dec.
C. compactus Retz.; 8, 4, H, common, –, June–Nov.
C. cuspidatus Kunth; 8, H, common, –, May–Oct.
C. cyperoides (L.) O.K.; 8,4, H, common, –, May–Oct.
C. diffusus Vahl; 8, H, common, –, May–Nov.
C. digitatus Roxb.; 4,6,8, H, common, –, Apr.–Oct.
C. distans L.f.; 8,4, H, common, +, May–Oct.
C. dubius Rottl.; 1, H, not common, +, Apr.–Sept.
C. iria L.; 4,6,8, H, common, –, Aug.–Nov.
C. pumilus L.; 8,4, H, common, –, July–Jan.
C. rotundus L.; 8, H, common, –, May–Nov.
C. trialatus (Boeck.) Kern; 1,2, H, common, +, June–Sept.
Fimbristylis dichotoma (L.) Vahl; 8,4, H, common, –, July–Nov.
F. dura (Zoll. & Mor.) Merr.; 1,8, H, common, –, May–Sept.
F. fimbristyloides (F.v.M.) Druce; 8, H, not common, –, July–Dec.
F. hookeriana Boeck.; 8,4,7, (cliffs); H, not common, –, July–Nov.
F. miliacea (L.) Vahl; 4,8,H, common, –, May–Oct.
Fuirena ciliaris (L.) Roxb.; 8,4, H, common, –, Oct.–Jan.
Scirpus grossus L.f.; 4,5, H, not common, –, Apr.–Nov.
Scleria caricina (R.Br.) Benth.; 4, H, not common, –, Aug.–Nov.
S. lithosperma (L.) Sw.; 1, H, common, –, May–Dec.
S. psilorrhiza C.B.Cl.; 1,2, H, not common, +, May–Nov.
S. rugosa R.Br.; 4,8, H, common, –, Oct.–Jan.

GRAMINEAE

Alloteropsis cimicina (L.) Stapf; 8, H, common, –, May–Sept.
Apluda mutica L. var. mutica; 8, H, not common, –, July–Jan.
Aristida balansae Henr.; 8, H, common, –, Oct.–Feb.
Arundinella setosa Trin.; 8,7 (cliffs); H, common, –, Oct.–Dec.
Axonopus compressus (Swz.) P. Beauv.; 8, H, common, –, June–Dec.
Bothriochloa intermedia (R. Br.) A. Cam. [includes *B. glabra* (Roxb.) A. Cam.] 8, H, common, –, May–Nov.
Brachiaria reptans (L.) G. & H.; 8, H, common, –, Jan.–Dec.
Capillipedium laoticum A. Cam.; 2,3, H, not common, –, Oct.–Dec.
Centotheca lappacea (L.) Desv.; 8, H, common, –, Oct.–Jan.
Chloris barbata (L.) Sw.; 8, H, very common, –, Apr.–Dec.
C. dolichostachya Lag.; 8, H, not common, –, Oct.–Dec.
Chrysopogon aciculatus (Retz.) Trin.; 8, H, common, –, May–Jan.
Coelorachis glandulosa (Trin.) Stapf ex Ridl.; 8, H, common, –, Jan.–Dec.
C. helferi (Hk.f.) Henr.; 1, H, not common, –, Apr.–Sept.
Cyrtococcum accrescens (Trin.) Stapf; 2,8, H, common, –, Apr.–Jan.
Dactyloctenium aegypticum (L.) P. Beauv.; 8, H, very common, –, Jan.–Dec.
Dicanthium annulatum (Forsk.) Stapf; 8, H, common, –, May–Jan.
Digitaria adscendens (H.B.K.) Henr. [includes *D. ciliaris* (Retz.) Koel.]; 8, H, common, –, Jan.–Dec.
D. bicornis (Lmk.) R. & S. ex Loud.; 8, H, common, –, Apr.–Dec.
D. longiflora (Retz.) Pers.; 8, H, common, +, Apr.–Dec.
D. siamensis Henr.; 8, H, common, –, May–Dec.
Echinochloa colonum (L.) Link; 8, H, very common, –, Jan.–Dec.
Eleusine indica (L.) Gaertn.; 8, H, common, –, Jan.–Dec.
Eragrosis diplachnoides Steud.; 8, H, common, –, Oct.–Dec.
E. elongata (Willd.) Jacq.; 8, H, common, –, Apr.–Dec.
E. malayana Stapf; 8, H, common, –, May–Dec.
Heteropogon contortus (L.) P. Beauv. ex R. & S.; 8, H, common, +, May–Dec.
H. triticeus (R. Br.) Stapf ex Craib; 4,8, H, common, –, Nov.–Jan.
Imperata cylindrica (L.) P. Beauv.; 8, H, very common, –, Jan.–Dec.
Ischaemum barbatum Retz.; 4,8, H, common, –, July–Dec.
I. rugosum Salisb. var. segetum Hack.; 4, H, not common, –, Oct.–Dec.
Neyraudia reynaudiana (Kunth) Keng & Hitch.; 8, H, common, –, Nov.–Mar.
Oplismenus compositus (L.) P. Beauv.; 1,8, H, common, +, Nov.–Feb.
Oryza minuta J.S. Presl ex C.B. Presl; 4,6, H, not common, –, Feb.–Sept.
Ottochloa nodosa (Kunth) Dandy; 1,8, H, common, –, May–Dec.
Panicum auritum Presl ex Nees; 1,8, H, not common, –, May–Dec.
P. sarmentosum Roxb.; 8, H, common, –, Nov.–Feb.
Paspalum conjugatum Berg.; 8, H, common, –, Jan.–Dec.
Pennisetum purpureum K. Sch.; 8, H, very common, –, Oct.–Jan.
Pseudopogonantherum contortum (Brongn.) A. Cam.; 8, 4, H, common, –, Nov.–Jan.

Saccharum spontaneum L.; 8, H, common, –, Oct.–Jan.
Sacciolepis indica (L.) Chase var. turgida (Ridl.) Gill.; 8, H, common, –, Oct.–Jan.
S. myosuroides (R. Br.) A. Cam.; 4, H, not common, –, Nov.–Jan.
Schizachyrium brevifolium (Sw.) Nees ex Buse; 8, H, not common, –, Nov.–Jan.
Setaria pallide-fusca (Schumach.) S. & H.; 8, H, common, –, June–Jan.
S. verticillata (L.) P. Beauv.; 8, H, not common, –, June–Oct.
S. palmifolia (Koen.) Stapf; 8, H, not common, –, Sept.–Jan.
Sorghum nitidum (Vahl) Pers.; 8, H, not common, –, June–Dec.
Thelepogon elegans Roth ex R. & S.; 2,7 (cliffs); H, not common, +, Sept.–Dec.
Themeda arundinacea (Roxb.) Ridl.; 8, H, not common, –, Nov.–Jan.

BAMBUSACEAE

Arundinaria ciliata A. Cam.; 2,3, S, not common, –, Feb.–Mar.
Bambusa arundinacea (Retz.) Willd.; 3,8, S, not common, –, Jan.–Apr.
B. tulda Roxb.; 3, S, common, –, Jan.–Mar.
Gigantochloa albo-ciliata (Mun.) Kurz; 3,2, S, common, –, Nov.–Jan.
Schizostachyum aciculare Gamb.; 8, S, very common, –, Dec.–Feb.
Thyrostachys siamensis Gamb.; 3,2, S, common, +, Nov.–Mar.

Unidentified Species

In this paper there are several species which I am either uncertain of their exact identities or have been unable to identify. It is quite likely that among the species resembling known species (indicated by "aff.") and these unidentified species are a few new records for Thailand and perhaps even some new species. For all of these species there are either no specimens or unidentified specimens in the BK and BKF collections.

I have not ventured to describe any new species in this paper nor have I offered explanations as to the possible relationships of most of the unidentified species since this work cannot be adequately done in Thailand.

ACKNOWLEDGEMENT

My sincere thanks is given to my able and resourceful field assistant Mr. Supee Dangjai, a ranger at Sam Lan, for his co-operation and overall knowledge of the Sam Lan forest. Without his assistance and enthusiasm many species would have gone unnoticed or uncollected. The assistance of Mr. Phairot Suvanakorn, Chief of the National Parks Division, Royal Forest Department, Bangkok, is also appreciated.

My former colleague Mrs. Chirayupin Chantraprasong at the BK herbarium, Mr. Robert Geesink and colleagues at the Rijksherbarium, Leiden, Netherlands; Prof. Kai Larsen of the University of Aarhus, Risskov, Denmark; and Dr. Tem Smitinand of the Forest Herbarium (BKF), Royal Forest Department, Bangkok contributed significantly to my herbarium work, library research, and writing this paper. I also would like to thank Mr. L.L. Forman, at Kew for identifying several species of Menispermaceae.

The section on Soils and Rocks could not have been completed without the help of Messrs. Mana Chuethongdee, Chalerm Wongvisitrangsi, and Poona Paosritoungkum, all of the Land Development Department, Ministry of Agriculture and Cooperatives, Bangkok. These soil scientists led a team which studied the soils and rocks at Sam Lan from 14–24 July 1975. I am grateful for their cooperation and detailed field studies, plus comments on the overall soil-vegetation relationships at Sam Lan.

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Printed at the Secretariat of the Cabinet Printing Office, Thailand.
Mr. Madhi Borisutdhi, Printer and Publisher 1978.