A FLORA OF DOI SUTHEP, DOI PUI, CHIANG MAI, NORTH THAILAND

by

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During the spring of 1966 a survey of the vegetation of the Doi Suthep, Doi Pui region resulted in extensive collections and identifications of plants of that area. The purpose of the survey was to describe and map the major associations of plants (phytocenoses) found in this tropical and mountainous area. The following floristic list evolved from the mapping work which included an attempt to fully describe the aerially recognizable phytocenoses. The physiognomy and floristic composition of these phytocenoses were determined by extensive sampling (Kuchler and Sawyer 1967). The resulting floristic list is presented giving the elevational extent, prevalence and fidelity of each species. Collections were made from February through May, 1966. Such data, although not exhaustive, not only supplement general information about Thai botany, but add to a further phytogeographic understanding of northern Thailand.

The Area

A vegetation map showing the extent and locations of the phytocenoses in presented elsewhere (Kuchler 1966). The study area is of irregular outline closely approximating 182 km^2. The area is approximately bounded by the geographical coordinates of 18°43′ and 18°51′ north latitude, and 98°52′ and 99°02′ east longitude. The northern and southern boundaries of the mapped area are arbitrary straight lines at the above latitudinal coordinates. The eastern boundary is the Maenam Ping, therefore much of the city of Chiang Mai is included in the map. The southwest border is the Nam Mae Pan and the Nam Mae Tha Chang. The western boundary of the area is a very sharply crested, unnamed ridge.

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The alluvial plain upon which Chieng Mai is located has elevations between 300 and 360 m. Doi Suthep and Doi Pui to the west rise to 1601 and 1685 m respectively.

The Vegetation

Ten phytocenoses were recognized in the area excluding the cultural units also described by KUCHLER and SAWYER (1967). These cultural units with their mainly exotic floras not included in this list are :–

The Royal Palace Grounds located on the southeast slopes of Doi Suthep.

The Forest Experiment Station Grounds near Ban Doi Suthep with its small plantations of *Eucalyptus* spp., *Pinus* spp. and other exotics.

The Ricefields on the alluvial plain surrounding Chiang Mai, and in the small valleys along the Nam Mae Tha Chang.

The Thai Villages and/or Orchards on the alluvial plain beyond Chiang Mai with *Euphoria longana, Mangifera indica, Musa paradisiaca* s.l., among others.

The Areas Settled and/or Exploited by Hill Tribes; a mosaic of cultivated fields, pastures and forest regeneration mainly to the west and north of Doi Pui at middle to high elevations.

Urban and suburban Chiang Mai.

The non-cultural phytocenoses were placed into the following categories as mapped by KUCHLER, the vegetation of the plains and alluvial fans, the vegetation of the lower mountain slopes, and the vegetation of the upper mountain slopes.

The lower elevational phytocenoses were greatly and extensively modified due to man's activities (SAWYER 1967), especially in areas immediately accessable via roads and trails. The presence of cultivars and pantropical weeds was most apparent in the phytocenoses of the plains and alluvial fans. Among the pantropical weeds were *Bidens pilosa, Cassia tora, Elephantopus scaber, Tridax procumbens, Urena lobata, Vernonia cinerea, Waltheria americana* and *Wedelia triloba.*

The vegetation of the lower mountain slopes was modified structurally by heavy cutting and then extensive stump and root sprouting. Also fire, in some cases occurring annually, greatly modified the structure of the low elevation types producing in some areas savanna-like structure. The forests of the upper mountain slopes were completely removed in some areas for planting of crops by the Hill Tribes. The remaining forests at high elevations were probably less modified by man's activities.

The following brief descriptions characterize the phytocenoses whose floras are included in the list.

Vegetation of the Plains and Alluvial Fans (300-360 m)

1. Phytocenoses with tall broadleaf, mostly tropophyllous trees and shrubs (*Butea monosperma, Casearia greviaefolia, Streblus asper*).
2. Phytocenoses of low or medium tall broadleaf tropophyllous trees and shrubs, bamboos and many vines (*Bambusa arundinacea, Calycopteris floribunda, Mimosa invisa*).

Vegetation of the Lower Mountain Slopes (350-1000 m)

3. Phytocenoses of tall and medium tall broadleaf tropophyllous trees with some bamboo (*Dipterocarpus obtusifolius, Pentacme suavis, Terminalia mucronata*).
4. Phytocenoses of tall and medium tall to low broadleaf tropophytllous trees with some to much bamboo (*Protium serratum, Tectona grandis, Terminalia mucronata, Dendrocalamus strictus*).
5. Phytocenoses of tall and medium tall to low broadleaf tropophyllous trees and shrubs with little to no bamboo (*Craibiodendron stellatum, Dipterocarpus obtusifolius, Shorea obtusa*).
6. Mosaic of Types 4 and 5.

Vegetation of the Higher Mountain Slopes (600-1685 m)

7. Phytocenoses of tall broadleaf evergreen trees with large crowns (*Castanopsis acuminatissima, Dipterocarpus costatus, Phoebe lanceolata*).

8. Phytocenoses of medium tall broadleaf evergreen and tropophyllous trees and shrubs and needleleaf evergreen trees with an open ground cover of graminoids (*Lithocarpus lindleyanus, Pinus merkusii, Shorea obtusa*).
9. Phytocenoses of medium tall broadleaf and needleleaf evergreen trees with a rather dense ground cover of graminoids (*Castanopsis argyrophylla, Pinus insularis, Themeda triandra*).
10. Phytocenoses of medium tall broadleaf evergreen trees and a ground cover of graminoids (*Castanopsis argyrophylla, Helicia nilagirica, Lithocarpus* spp.).
11. Phytocenoses of tall and medium tall broadleaf evergreen trees (*Castanopsis acuminatissima, Nyssa javanica, Schima wallichii*).

Complete descriptions of the types can be found in KUCHLER and SAWYER (1967).

Tropophylly

KUCHLER and SAWYER (1967) have proposed a refinement of the concept of *deciduousness* (the annual shedding of leaves by woody plants) as a result of this work. To date the concept has included two rather different phenomena, the synchronized leaf fall characteristic of temperate latitudes and the unsynchronized leaf fall characteristic of tropical latitudes. Individuals of temperate species tend to loose their leaves more or less in unison during a rather definite, short season; species displaying this pattern are described as being *deciduous*. It has been proposed to restrict the adjective to only this phenomenon. Many tropical species also change their leaves annually, but the time of occurrence and synchronization are not evident for a single species. Rather the time and extent of leaf fall varies from individual to individual, apparently in response to immediate site conditions. Thus one sees on the same day individuals of the same species in new leaf, completely devoid of leaves and in the process of shedding old leaves. This was most conspiuously shown by many species of the lower mountain slopes, especially the abundant *Dipterocarpus obtusifolius*. Those species displaying this pattern of unsynchronized annual leaf fall are herein described as being *tropophllous* instead of deciduous.

Annotated List of Doi Suthep, Doi Pui Plants*

PTERIDOPHYTES

Lycopodiinae

Selaginellaceae

Selaginella spp., phytocenoses 3, 5, infrequent in 4, 7, 11; 422-540, 955-1020 m.

Filicinae

Marattiaceae

Angiopteris evecta (Forst.) G.F. Hoffm., infrequent in phytocenoses 7, 11; 955-1200 m.

Schizaeaceae

Lygodium flexuosum (Linn.) Sw., phytocenoses 1, 2, 3, 4, 5, 7, 8, 11; 320-1685 m.

Lygodium polystachyum Wall., infrequent in phytocenose 7; 950 m.

Gleicheniaceae

Dicranopteris linearis (Burm. f.) Underw., infrequent in phytocenose 8; 1110 m.

Cyatheaceae

Cyathea sp., infrequent in phytocenose 11; 1160 m.

Polypodiaceae

Leptochilus decurrens Bl., phytocenose 11; 1010-1250 m.

Pseudodrynaria coronans (Wall. ex Mett.) Ching, infrequent in phytocenoses 7, 11; 920-1100 m.

Platycerium sp., infrequent in phytocenose 4; 512 m.

Thelypteridaceae

Thelypteris ciliata (Wall.) Ching, infrequent in phytocenoses 7, 10; 800, 1410 m.

Thelypteris squamulosa (Schlecht.) Ching, infrequent in phytocenose 11; 1310 m.

Dennstaedtiaceae

Asplenium nidus Linn., infrequent in phytocenose 11; 1250 m.

Athyrium simplicivenium Holtt., infrequent in phytocenoses 7, 11; 955, 1200 m.

Bolbitis sp., phytocenose 7, infrequent in 11; 950-970 m.

Brainea insignis (Hk.) J. Sm., infrequent in phytocenose 7; 950 m.

Dryopteris arida O. Ktze., phytocenose 11, infrequent in 7; 1010-1160 m.

Dryopteris calcarata O. Ktze., infrequent in phytocenose 7; 955 m.

Dryopteris cochleata (Don) C. Chr., infrequent in phytocenose 7; 775 m.

Dryopteris hirtipes (Bl.) O. Ktze., infrequent in phytocenose 11; 1250 m.

Dryopteris mollis Hiern., phytocenoses 7, 10, 11; 920-1020, 1200, 1520 m.

Dryopteris spp., infrequent in phytocenoses 5, 7, 11; 540, 950 m.

Microlepia speluncae (Linn.) Moore, phytocenoses 7, 11; 950, 1160-1310 m.

Microlepia speluncae (Linn.) Moore var. *villosissima* C. Chr., infrequent in phytocenose 11; 1200 m.

Polystichum biaristatum (Bl.) Moore, infrequent in phytocenoses 7, 11; 955 1250 m.

Pteridium aquilinum (Linn.) Kuhn, phytocenose 8, common in 9, 10; 1110, 1410-1685 m.

Pteris heteromorpha Fée, infrequent in phytocenoses 3, 7; 775-825 m.

Pteris longipes Don, infrequent in phytocenose 11; 1200 m.

Pteris quadriaurita Retz.; phytocenoses 7, 11; 800-1200 m.

Pteris sp., infrequent in phytocenose 7; 970 m.

Rumohra aristata Ching, infrequent in phytocenose 11; 1310 m.

Schizoloma ensifolium (Sw.) J. Sm., phytocenose 7, infrequent in 11; 800-1325 m.

Tectaria devexa (Kze.) Copel., infrequent in phytocenose 1; 380 m.

Tectaria variolosa (Wall.) C.Chr., phytocenoses 3, 7; 800-970 m.

Adiantaceae

Adiantum caudatum Linn., phytocenoses 3, 5; 430-540 m.

GYMNOSPERMAE

Cycadaceae

Cycas micholitzii Dyer var. nov., phytocenoses 7, 10, 11; 800-1200, 1410 m.

Podocarpaceae

Podocarpus neriifolia D. Don , infrequent in phytocenose 11; 250 m.

Cephalotaxaceae

Cephalotaxus sp., infrequent in phytocenose 11; 700-1000 m.

Pinaceae

Pinus insularis Endl., phytocenoses 8, 10, common in 9; 1110-1685 m.

Pinus merkusii Jungh. & De Vriese, common in phytocenose 8; 1060-1115 m.

Gnetaceae

Gnetum montanum Mkgr., phytocenoses 8, 10, infrequent in 1, 5, 11; 400-1020 m

ANGIOSPERMAE

I. Monocotyledoneae

Pandanacae

Pandanus furcatus Roxb., phytocenoses 7, 11; 950-1250 m.

Gramineae

Alloteropsis semialata (R. Br.) Hitchc., phytocenose 8; 1000-1060 m.

Apluda mutica Linn., phytocenoses 3, 5, 8, 10, infrequent in 4; 430-1110, 1410 m.

Aristida chinensis Munro, phytocenose 1; 330-400 m.

Aristida cumingiana Trin. & Rupr., phytocenose 8, infrequent in 5; 350, 1115 m.

Arundinella bengalensis (Spreng) Druce, infrequent in phytocenose 5; 320 m.

Arundinella setosa Trin., phytocenoses 3, 10, common in 5, 8, 9; 420-1520 m.

Arundinella sp., phytocenose 10; 1520-1600 m.

Bambusa arundinacea Willd., phytocenose 1, common in 2, infrequent in 4; 330-380 m.

Bambusa tulda Roxb., phytocenoses 2, 4, 5, 7, 8, common in 3, infrequent in 1; 320-1000 m.

Capillipedium assimile (Steud.) A. Camus, phytocenoses 8, 10, infrequent in 5; 890-975, 1685 m.

Cymbopogon winterianus Jowitt, infrequent in phytocenose 5; 890 m.

Cyrtococcum oxyphyllum (Steud.) Stapf., infrequent in phytocenose 11; 950 m.

Cyrtococcum sp., infrequent in phytocenose 1; 400 m.

Dendrocalamus strictus Nees, phytocenoses 2, 8, common in 3, 4, infrequent in 1, 5; 320-1010 m.

Eleusine indica (Linn.) Gaertn., phytocenose 2; 385 m.

Eragrostis zeylanica Nees & Mey., phytocenose 2; 385 m.

Eragrostis sp., phytocenoses 1, 2; 330-385 m.

Erianthus longisetosus Anderss., phytocenose 5; 600-890 m.

Eulalia birmanica (Hook. f.) A. Camus, phytocenoses 5, 8; 600, 975 m.

Eulalia phaeothrix (Hack.) O. Ktze., infrequent in phytocenose 5; 430 m.

Eulalia siamensis Bor, infrequent in phytocenoses 1, 8; 380, 975 m.

Eulalia sp., phytocenoses 8, 9, 10, infrequent in 5, 11; 650, 1110, 1520-1540 m.

Eulalia speciosa (Deb.) O. Ktze., phytocenoses 5, 8, 9, 10; 875-1685 m.

Gigantochloa albo-ciliata (Munro) Kurz, phytocenoses 2, 3, 7; 380-1010 m.

Gymnopogon delicatulus (C.B. Clarke) Bor, infrequent in phytocenoses 1, 5; 330-350 m.

Heteropogon contortus (Linn.) P. Beauv. ex Roem. & Schult., phytocenose 5; 320-350 m.

Heteropogon triticeus (R. Br.) Stapf. ex Craib, phytocenose 5; 320-685 m.

Imperata cylindrica (Linn.) P. Beauv., phytocenoses 5, 10; 320-1685 m.

Isachne sp., phytocenose 5; 320-600 m.

Microstegium vagans (Nees ex Steud.) A. Camus, phytocenoses 7, 10; 920-1620 m.

Mnesithea laevis (Retz.) Kunth, phytocenose 10, infrequent in 4; 365-1190 m.

Oplismenus compositus (Linn.) P. Beauv., phytocenose 11, common in 7, infrequent in 1, 5; 320-1250 m.

Panicum incomtum Trin., phytocenoses 2, 3, 7, 10, infrequent in 4; 390-1685 m.

Panicum sp., infrequent in phytocenose 4; 480 m.

Pogonatherum paniceum (Lamk.) Hack., infrequent in phytocenose 5; 320 m.

Sacciolepis sp., phytocenose 9; 1520 m.

Schizostachyum cf. *zollingeri* Steud., infrequent in phytocenose 11; 1200 m.

Setaria pallide-fusca (Schum.) Stapf & C. E. Hubb., phytocenose 5; 320-385 m.

Setaria plicata (Lamk.) T. Cooke, phytocenoses 10, 11, infrequent in 7; 920-1685 m.

Themeda arundinacea (Roxb.) Ridl., phytocenoses 8, 9, 10, infrequent in 5; 680-1520 m.

Themeda triandra Forsk., phytocenoses 5, 8, 10, common in 9; 680-1520 m.

Thysanolaena maxima (Roxb.) O. Ktze., phytocenoses 9, 10, 11; 1020-1685 m.

Cyperaceae

Carex baccans Nees, infrequent in phytocenose 11; 1100 m.

Carex condensata Nees, phytocenose 10; 1600 m.

Carex indica Linn., phytocenose 9, infrequent in 3; 725, 1500 m.

Carex spp., phytocenoses 4, 10, 11; 365, 1160-1685 m.

Cyperus sp., phytocenose 5; 350-650 m.

Fimbristylis sp., phytocenoses 1, 3, 5; 400-650 m.

Rhynchospora rubra (Lour.) Makino, phytocenose 5; 320-680 m.

Scleria levis Retz., phytocenose 7, infrequent in 5; 430, 950-970 m.

Scleria oblata S.T. Blake, infrequent in phytocenose 11; 1325 m.

Scleria pergracilis (Nees) Kunth, infrequent in phytocenose 5; 650 m.

Scleria scrobiculata Nees & Mayan, phytocenoses 7, 8, 10, 11, infrequent in 3; 800-1220 m.

Scleria sp., phytocenoses 4, 5, 7, 8, 11; 365-1100 m.

Scleria tonkinensis C.B. Clarke, phytocenose 8; 1115 m.

Palmae

Areca triandra Roxb., phytocenose 11; 1100-1325 m.

Calamus kerrianus Beccari, infrequent in phytocenose 11; 1160 m.

Calamus spp., phytocenose 11, common in 7, infrequent in 3; 800-1310 m.

Livistona speciosa Kurz, infrequent in phytocenose 7; 970 m.

Phoenix humilis Royle, phytocenose 8, common in 5; 320-1100 m.

Wallichia caryotoides Roxb., phytocenoses 7, 11; 920-1200 m.

Araceae

Acorus calamus Linn., infrequent in phytocenose 11; 1250 m.

Alocasia beccarii Engl., infrequent in phytocenose 11; 1310 m.

Alocasia sp., infrequent in phytocenose 11; 1310 m.

Amorphophallus sp., phytocenose 11; 688, 1160-1310 m.

Anadendrum sp., infrequent in phytocenose 11; 1020 m.

Arisaema sp., infrequent in phytocenose 7; 970 m.

Homalomena sp., infrequent in phytocenose 11; 1020 m.

Lasia spinosa (Linn.) Thw., infrequent in phytocenose 7; 955 m.

Pothos cathcartii Schott, phytocenose 11; 1250-1325 m.

Raphidophora sp., infrequent in phytocenose 11; 1310 m.

Scindapsus officinalis Schott, infrequent in phytocenose 4; 512 m.

Commelinaceae

Aneilema sp., phytocenose 10; 1410-1600 m.

Commelina sp., phytocenoses 7, 11; 950-1540 m.

Forrestia sp., phytocenose 11, infrequent in 7; 950-1325 m.

Murdannia sp., phytocenoses 3, 7, infrequent in 4, 5; 422, 710-1060 m.

Liliaceae

Chlorophytum spp., phytocenoses 5, 9; 430, 1500 m.

Dianella ensifolia DC., phytocenose 11, common in 7, 10; 920-1685 m.

Lilium primulinum Baker, phytocenose 10, common in 9; 1500-1600 m.

Ophiopogon sp., phytocenoses 5, 7, infrequent in 4, common in 11; 480-1325 m.

Peliosanthes sp., infrequent in phytocenoses 1, 7, 11; 380-950 m.

Tupistra albiflora K. Larsen, phytocenoses 8, 11, infrequent in 4, 7; 520-1200 m.

Smilacaceae

Smilax china Linn., phytocenose 11, infrequent in 7; 950-1100 m.

Smilax corbularia Kunth, phytocenose 8, infrequent in 4, common in 7, 11; 365, 800-1540 m.

Smilax kingii Hook. f., phytocenose 3, infrequent in 4; 480-725 m.

Smilax lanceaefolia Roxb., phytocenoses 8, 11, infrequent in 5, common in 7; 350, 920-1325 m.

Smilax perfoliata Lour., phytocenoses 7, 11; 920-1540 m.

Smilax polyacantha Wall., phytocenose 8, infrequent in 1, 3, 5, 11; 400-1200 m.

Smilax spp., phytocenoses 3, 4, 5, 7, 8, 10, 11; 422-1685 m.

Stemonaceae

Stemona burkillii Prain, infrequent in 3, 4, 5, 8; 825-1000 m.

Stemona sp., phytocenose 3, infrequent in 1; 380-430 m.

Amaryllidaceae

Crinum cf. *wattii* Baker, common in phytocenose 2; 385-390 m.

Curculigo orchidoides Gaertn., infrequent in 7; 955 m.

Curculigo sp., phytocenoses 10, 11, common in 7; 430-1685 m.

Taccaceae

Tacca sp. infrequent in phytocenoses 7, 11; 955-1200 m.

Dioscoreaceae

Dioscorea sp., phytocenoses 3, 4, 5, 10, common in 2, infrequent in 11; 350-1540m.

Musaceae

Musa acuminata Colla, phytocenose 11, infrequent in 7; 970-1540 m.

Zingiberaceae

Alpinia malaccensis Rosc., phytocenoses 8, 10, infrequent in 3; 688-1410 m.

Alpinia sp., infrequent in phytocenose 7; 970 m.

Costus speciosus Sm., phytocenose 7, infrequent in 11; 955-1200 m.

Gagnepainia sp., infrequent in phytocenose 1; 380 m.

Globba sp., phytocenose 8, infrequent in 5, 7; 775-1060 m.

Kaempferia rotunda Linn., phytocenoses 2, 3, 8, 10, infrequent in 5, 7, 11; 385-1190 m.

Marantaceae

Phrynium parviflorum Roxb., phytocenose 11; infrequent in 7; 970-1310 m.

Orchidaceae

Bulbophyllum sp., phytocenose 10, infrequent in 7; 1010-1600 m.

Dendrobium secundum (Bl.) Lindl., phytocenose 5; 320-650 m.

Dendrobium sp., phytocenoses 3, 9, 10; 430, 1520-1600 m.

Geodorum siamense Rolfe, infrequent in phytocenose 5; 775-800 m.

Luisia sp., infrequent in phytocenose 5; 540 m.

Peristylus sp., infrequent in phytocenose 10; 1410 m.

Stereosandra javanica Bl., infrequent in phytocenose 11; 955 m.

Vanilla siamensis Rolfe ex Downie, phytocenose 11, infrequent in 7; 950-1020 m.

II. Dicotyledoneae

Piperaceae

Piper sarmentosum Roxb., phytocenose 2, infrequent in 1; 380-390 m.

Piper sp., infrequent in phytocenoses 7, 11; 955-1325 m.

Chloranthaceae

Chloranthus officinalis Bl., phytocenoses 7, 11; 950-1310 m.

Juglandaceae

Engelhardia spicata Lech. ex Bl., phytocenoses 5, 7, 8, 10. 11, common in 9; 540-1540 m.

Betulaceae

Betula alnoides Buch.-Ham., phytocenoses 10, 11, infrequent in 7; 955-1540 m.

Carpinus viminea Wall., phytocenoses 10, 11, infrequent in 7; 775-1540 m.

Fagaceae

Castanopsis acuminatissima (Bl.) Red. phytocenose 10, common in 7, 11; 920-1600 m.

Castanopsis argyrophylla King, phytocenoses, 7, 8, 11, common in 9, 10; 920-1685 m.

Castanopsis echinocarpa A. DC., phytocenoses 5, 8, 10, infrequent in 11; 430-1190 m.

Castanopsis indica A. DC., infrequent in phytocenose 7; 800 m.

Castanopsis tribuloides A. DC., phytocenoses 7, 10, 11; 800-1325 m.

Lithocarpus garrettianus (Craib) A. Camus, phytocenoses 3, 5, 10, 11, common in 7; 800-1410 m.

Lithocarpus lindleyanus Wall., phytocenose 3, infrequent in 5, common in 8; 875-1410 m.

Lithocarpus microspermus A. Camus, phytocenoses 7, 11; 950-1250 m.

Lithocarpus polystachyus Wall., phytocenoses 4, 5, 8, 9, 10, 11; 365, 600-1520 m.

Lithocarpus sootepensis A. Camus, phytocenose 10, common in 8, infrequent in 3, 5; 725-1410 m.

Lithocarpus spp., phytocenoses 3, 7, 9, 10, 11; 430, 955-1600 m.

Lithocarpus spicatus (Sm.) Rehder, infrequent in phytocenoses 3, 7, 11; 422-1020 m.

Lithocarpus thomsoni Miq., infrequent in phytocenoses 3, 7, 11; 825-950 m.

Lithocarpus truncatus (King) Rehd. & Wils., phytocenoses 8, 10, common in 9; 1110-1520 m.

Quercus brandisiana Kurz, phytocenoses 8, 10, infrequent in 5; 875, 1060-1190 m.

Quercus helferiana A. DC., phytocenoses 8, 10; 1115-1520 m.

Quercus kerrii Craib, phytocenose 3; 422 m.

Quercus kingiana Craib, phytocenoses 5, 8, infrequent in 7, 11; 600-1115 m.

Quercus mespilifolioides A. Camus, phytocenoses 3, 9, 10, infrequent in 1, 4, common in 5, 8; 320-1520 m.

Quercus oidocarpa Korth., phytocenose 9, infrequent in 7; 950-1520 m.

Quercus semiserrata Roxb., infrequent in phytocenoses 7, 11; 920, 1250 m.

Ulmaceae

Holoptelea integrifolia Planch., phytocenose 1, common in 2; 380-390 m.

Trema orientalis Bl., infrequent in phytocenose 11; 1020 m.

Moraceae

Allaeanthus sp., infrequent in phytocenose 1; 380 m.

Artocarpus heterophyllus Lamk., infrequent in phytocenose 1; 350 m.

Artocarpus spp., phytocenoses 7, 8, infrequent in 3, 4, 5, 11; 955-1200 m.

Ficus altissima Bl., phytocenose 1; 380-400 m.

Ficus aurantiacea Griff., phytocenose 7, infrequent in 11; 775-800, 955, 1250 m.

Ficus benjamina Linn., infrequent in phytocenose 1; 380 m.

Ficus glomerata Roxb., infrequent in phytocenose 1; 310 m.

Ficus hirta Vahl, phytocenoses 7, 11, infrequent in 1, 5; 380, 680, 775-800, 990-1250 m.

Ficus microcarpa Linn. f., infrequent in phytocenose 1, 380 m.

Ficus cf. *oligodon* Miq., infrequent in phytocenose 11; 1220 m.

Ficus religiosa Linn., phytocenose 1; 310 m.

Ficus spp., phytocenoses 1, 3, 7, 8, 11; 310, 380, 825-1250 m.

Ficus virens Ait., infrequent in phytocenoses 1, 8; 310, 1000 m.

Morus laevigata Wall., phytocenose 11, infrequent in 1; 380, 950-1200 m.

Streblus asper Lour., phytocenose 2, common in 1; 310-540 m.

Streblus taxoides (Heyne) Kurz, infrequent in phytocenose 1; 320 m.

Urticaceae

Debreggeasia sp., infrequent in phytocenose 11; 1540 m.

Proteaceae

Helicia nilagirica Bedd., phytocenoses 7, 8, infrequent in 3, 5, common in 9 ,10; 725, 875, 975-1685 m.

Helicia sp., phytocenose 1, infrequent in 3, 5, 11; 400-540, 1250 m.

Olacaceae

Anacolosa ilicoides Mast., phytocenose 11, infrequent in 3, 7; 725, 920-1200 m.

Opiliaceae

Melientha suavis Pierre, phytocenoses 7, 11, infrequent in 5; 350, 775-1020 m.

Opilia amentacea Roxb., phytocenose 2; 385 m.

Santalaceae

Henslowia sp., phytocenose 9; 1520 m.

Loranthaceae

Loranthus sp., infrequent in phytocenose 1, 5; 330-430 m.

Scurrula sp., phytocenose 3, infrequent in 5; 350, 725 m.

Viscum articulatum Burm. f., phytocenose 9, infrequent in 1; 320, 1520-1540 m.

Aristolochiaceae

Aristolochia sp., infrequent in phytocenose 5; 540 m.

Rafflesiaceae

Sapria himalayana Griff., phytocenose 11; 1200 m.

Polygonaceae

Polygonum chinense Linn., phytocenoses 10, 11, infrequent in 7; 950-1685 m.

Amaranthaceae

Achyranthes bidentata Bl., infrequent in phytocenose 1; 380 m.

Aerva sanguinolenta (Linn.) Bl., phytocenoses 1, 2, infrequent in 4, 11; 380-512, 1540 m.

Menispermaceae

Cyclea polypetala Dunn, infrequent in phytocenose 11; 1325 m.

Stephania sp., infrequent in phytocenose 3; 825 m.

Magnoliaceae

Magnolia coco (Lour.) A. DC., infrequent in phytocenose 7; 955 m.

Manglietia garrettii Craib, phytocenose 11; 950-1540 m.

Michelia champaca Linn., infrequent in phytocenoses 7, 11; 775-950 m.

Michelia floribunda Finet & Gagnep., phytocenose 7, infrequent in 11; 900-1100 m.

Michelia sp., phytocenose 11, infrequent in 7; 950-1160 m.

Talauma hodgsoni Hook. f. & Thoms., phytocenose 7; 955-970 m.

Annonaceae

Anomianthus dulcis (Dunal) Sinclair, phytocenoses 1, 4; 310-600 m.

Cananga latifolia Finet & Gagnep., infrequent in phytocenose 4; 520 m.

Cananga sp., infrequent in phytocenose 11; 1250 m.

Dasymaschalon sp., infrequent in phytocenose 11; 1250 m.

Desmos dubius Craib, infrequent in phytocenoses 1, 5; 320-330 m.

Desmos sp., infrequent in phytocenose 11; 1250 m.

Fissistigma sp., infrequent in phytocenose 11; 1200 m.

Miliusa velutina Hook. f. & Thoms., phytocenose 4; 480, 710 m.

Mitrephora sp., infrequent in phytocenose 7; 775-800 m.

Polyalthia suberosa Benth. & Hook. f., infrequent in phytocenose 1; 380 m.

Uvaria ferruginea Buch.–Ham. ex Hook. f. & Th., phytocenose 5; 540 m.

Uvaria sp., phytocenose 3; 422 m.

Myrsinaceae

Ardisia maculosa Mez., phytocenoses 7, 11; 920-1200 m.

Embelia ribes Burm., phytocenose 7, infrequent in 10, 11; 400, 920-1020, 1410 m.

Maesa montana A. DC., common in phytocenoses 7, 11; 920-1325, 1540 m.

Lauraceae

Cinnamomum iners Reinw , phytocenoses 7, 11, infrequent in 3; 775-1250, 1540 m.

Cinnamomum sp., phytocenose 11; 950-1200 m.

Cryptocarya sp. phytocenoses 7, 10, 11; 775, 950-1250, 1685 m.

Litsea glutinosa (Lour.) C.B. Robins., phytocenoses 1, 3; 320-400 m.

Litsea polyantha Juss., phytocenoses 1, 11; 950-1200 m.

Litsea sp., phytocenose 10; 380 m.

Neolitsea spp., common in phytocenoses 7, 11; 775, 920-1325 m.

Phoebe lanceolata Nees, common in phytocenoses 7, 11; 775, 920-1310 m.

Hernandiaceae

Illigera sp., infrequent in phytocenose 11; 950 m.

Capparidaceae

Capparis sepiaria Linn., infrequent in phytocenose 1; 400 m.

Crataeva religiosa Forst. f., phytocenose 2; 385-390 m.

Escalloniaceae

Polyosma elongata Geddes, infrequent in phytocenose 11; 1325 m.

Rosaceae

Parinari annamense Hance, phytocenose 5, common in 1; 310-480 m.

Photinia sp., infrequent in phytocenose 11; 1220 m.

Rubus efferatus Craib, infrequent in phytocenose 11; 1540 m.

Rubus multibracteata Lév. & Van., phytocenoses 10, 11; 1200-1220, 1616-1685 m.

Rubus sp., phytocenoses 10, 11; 1100-1310 m.

Mimosaceae

Acacia pennata Willd., phytocenose 2; 385 m.

Acacia sp., phytocenoses 8, 10, infrequent in 4; 640, 1110-1410 m.

Adenanthera microsperma Teijsm. & Binn., phytocenoses 1, 2, 3, infrequent in 4; 380-520, 825 m.

Albizzia lebbekoides Benth., phytocenoses 1, 3, 4, infrequent in 7, 8, 380-975 m.

Albizzia lucida Benth., phytocenose 1; 380 m.

Albizzia odoratissima Benth., infrequent in phytocenoses 1, 5; 380, 680 m.

Albizzia procera Benth., infrequent in phytocenose 1; 310 m.

Mimosa invisa Mart., common in phytocenose 2; 385-390 m.

Pithecellobium glomeriflorum Kurz, phytocenoses 7, 10, infrequent in 3, 5, common in 11; 365, 920-1540 m.

Samanea saman Merr., phytocenose 1, common in 2, 310-390 m.

Xylia kerrii Craib & Hutch., phytocenoses 1, 5, 8, common in 2, 3, 4, infrequent in 7; 365-1000 m.

Caesalpiniaceae

Bauhinia hirsuta Weinm., phytocenose 2, infrequent in 4; 390-480 m.

Bauhinia kerrii Craib, phytocenoses 7, 11; 950-1325 m.

Bauhinia sp., phytocenose 3, infrequent in 1, 4, 5, 7; 400-890 m.

Cassia bakeriana Craib, infrequent in phytocenose 11; 1310 m.

Cassia fistula Linn., phytocenoses 1, 3, 5, common in 4; 310-890 m.

Cassia leschenaultiana DC., phytocenose 10; 1600 m.

Cassia siamea Lamk., phytocenoses 1, 2; 310-400 m.

Cassia sp., infrequent in phytocenose 3; 825 m.

Cassia timoriensis A. DC., infrequent in phytocenose 1; 310 m.

Cassia tora Linn., infrequent in phytocenose 1; 380 m.

Caesalpinia mimosoides Lamk., phytocenose 2; 385 m.

Mezoneurum hymenocarpum Hook. f. & Jack., infrequent in phytocenose 4; 688 m.

Pterolobium macropterum Kurz, phytocenose 1; 330-400 m.

Sindora siamensis Teysm. ex Miq., phytocenose 1; 330-512 m.

Tamarindus indica Linn., infrequent in phytocenose 1; 310 m.

Papilionaceae

Butea monosperma O. Ktze., phytocenose 1, 2; 380-400 m.

Butea superba Roxb., phytocenoses 1, 3, 4, 5, 8, infrequent in 7, 11; 320-1115 m.

Crotalaria bialata Roxb., phytocenose 5; infrequent in 1; 330-540 m.

Crotalaria chinensis Linn., phytocenose 8; 1110 m.

Crotalaria ferruginea R. Grah., phytocenose 10; 1600 m.

Crotalaria sp., phytocenose 10, infrequent in 5; 350, 1600 m.

Dalbergia cultrata R. Grah., phytocenose 1, 3, 4, 5, 9, 10, infrequent in 11, 365-540, 1410-5410 m.

Dalbergia cf. *dongnaiensis* Pierre, phytocenoses 2, 5, 9, 10, common in 3, 8; infrequent in 4, 7; 385-430, 725-1190, 1500 m.

Dalbergia floribunda Craib, phytocenose 11; 1160, 1310 m.

Dalbergia foliacea Wall. ex Benth., phytocenose 2; 385 m.

Dalbergia spp., phytocenoses 1, 3, 4, infrequent in 8, 11; 380-688, 1060, 1540 m.

Dalbergia stipulacea Roxb., phytocenoses 7, 10, 11; 1010-1410 m.

Derris sp., phytocenose 10; 1520 m.

Desmodium gangeticum DC., phytocenose 2; 390 m.

Desmodium insigne Prain, phytocenose 10, infrequent in 5, common in 9; 430, 1500-1600 m.

Desmodium oblongum Wall., phytocenoses 5, 8, 10, infrequent in 3, common in 9; 430, 600-1520 m.

Desmodium ovalifolium Wall. ex Merr., phytocenose 3; 725 m.

Desmodium pulchellum Benth., phytocenose 3, infrequent in 4; 520, 725 m.

Desmodium renifolium Schindler, phytocenoses 7, 11; 970-1200 m.

Desmodium sp., infrequent in phytocenose 11; 950 m.

Dunbaria longeracemosa Craib, phytocenoses 3, 5, infrequent in 1, common in 8; 320-1115 m.

Eriosema chinense Vog., phptocenose 7; 920-990 m.

Erythrina sp., phytocenose 11; 1150 m.

Flemingia congesta Roxb., infrequent in phytocenose 5; 430 m.

Flemingia sootepensis Craib, phytocenoses 9, 10, 11, common in 7; 920-1540 m.

Flemingia sp., phytocenoses 1, 3, 5. 7, 8, 11, infrequent in 4; 955-1200 m.

Flemingia strobilifera R. Br. ex Ait., infrequent in phytocenose 3; 422 m.

Indigofera sp., phytocenose 10, infrequent in 5; 350, 1520 m.

Indigofera stachyodes Lindl., phytocenose 10; 1600 m.

Millettia brandisiana Kurz, phytocenose 3; 422 m.

Millettia extensa Benth. ex Baker, phytocenoses 3, 10, infrequent in 4, 7, common in 8; 422, 710-1190 m.

Millettia ovalifolia Kurz, phytocenoses 1, 3, common in 2; 380-512 m.

Millettia spp., phytocenoses 2, 3, infrequent in 4; 385-512 m.

Mucuna collettii Lace, infrequent in phytocenose 11; 1160 m.

Mucuna pruriens DC., phytocenose 10, common in 9; 1500-1685 m.

Pterocarpus macrocarpus Kurz, phytocenoses 1, 2, 3, 5, 8, common in 4; 320-1060 m.

Pueraria spp., phytocenose 10, infrequent in 4, 7, 11; 950-1190 m.

Pueraria wallichii DC., phytocenoses 8, 10, infrequent in 5, 7; 975-1410 m.

Smithia sensitiva Ait., phytocenoses 9, 10; 1520-1600 m.

Spatholobus parviflorus Kuntzes, infrequent in phytocenose 5; 680 m.

Vigna sp., phytocenose 10; 1520 m.

Erythroxylaceae

Erythroxylum cuneatum (Wall.) Kurz, phytocenoses 1, 5, infrequent in 4, 10; 320-480, 1190 m.

Rutaceae

Aegle marmelos Corr., phytocenoses 2, 4; 383, 688-710 m.

Clausena excavata Burm. f., phytocenoses 3, 5, 8, 11; 320, 722-1325 m.

Evodia gracilis Kurz, infrequent in phytocenose 7, common in 11; 1220-1325 m.

Evodia spp., phytocenoses 7, 11; 955-1250 m.

Glycosmis citrifolia Lindl., infrequent in phytocenose 7; 955 m.

Toddalia asiatica Lamk., phytocenose 11, infrequent in 7; 950-1220 m.

Simaroubaceae

Brucea javanica (Linn.) Merr., phytocenoses 1, 2, infrequent in 4; 330-480 m.

Eurycoma longifolia Jack, phytocenose 5, infrequent in 1; 330-350, 600-680 m.

Harrisonia perforata Merr., phytocenoses 1, 2, 3, 4; 380-688 m.

Irvingia malayana Oliver ex A. Benn., phytocenoses 1, 2, 3, 4, 5; 350-430, 688-890 m.

Picrasma javanica Bl., phytocenoses 11, infrequent in 3, 7; 422, 955-1325 m.

Burseraceae

Canarium subulatum Guill., phytocenoses 1, 3, 5, 7, 8, 10, common in 4, 11; 320-1520 m.

Garuga pinnata Roxb., phytocenoses 2, 4; 385-688 m.

Protium serratum Engl., phytocenoses 1, 3, 7, common in 4, infrequent in 5; 365-920 m.

Meliaceae

Amoora polystachya Wight & Arn., phytocenoses 1, 7, 11; 365-1250 m.

Amoora sp., phytocenose 11, infrequent in 7; 950-1200 m.

Cedrela toona Roxb., phytocenoses 7, 11, infrequent in 3; 825-1200 m.

Chisocheton sp., phytocenose 11, infrequent in 7; 955-1325 m.

Chukrasia velutina Wight & Arn., infrequent in phytocenoses 1, 4; 330-512 m.

Sandoricum indicum Cav., infrequent in 1, 7; 380, 955 m.

Walsura sp., phytocenoses 1, 3, 4, 5, 11; 350-1540 m.

Malpighiaceae

Hiptage candicans Hook. f., phytocenose 8, infrequent in 1, 4; 380-480, 975-1060 m.

Polygalaceae

Polygala longifolia Poir., infrequent in phytocenose 5; 650 m.

Polygala persicariaefolia DC., phytocenose 10; 1600 m.

Polygala sp., phytocenose 10; 1600 m.

Polygala tricholopha Chod., infrequent in phytocenose 11; 1220 m.

Xanthophyllum sp., infrequent in phytocenoses 1, 11; 380, 1160 m.

Xanthophyllum virens Roxb., phytocenoses 8, 11, infrequent in 7; 950-1200 m.

Euphorbiaceae

Antidesma sp., phytocenoses 2, 3, 4, 8, 11, infrequent in 1, 5, common in 7; 385-1310 m.

Antidesma velutinum Tul., infrequent in 11; 1325 m.

Aporosa villosa Baill., phytocenoses 1, 3, 4, 7, 10, common in 5, 8, infrequent in 11; 320-1410 m.

Baccaurea sp., phytocenoses 7, 11, infrequent in 3, 4; 365, 825-1220 m.

Baliospermum axillare Bl., phytocenose 11; 950-1325 m.

Bischofia javanica Bl., infrequent in phytocenoses 7, 11; 950-970 m.

Bridelia retusa Spreng., infrequent in phytocenoses 1, 5; 350-400 m.

Bridelia sp., infrequent in phytocenose 4; 640 m.

Cleidion sp., infrequent in phytocenoses 1, 11; 380, 1200 m.

Cleistanthus sp., infrequent in phytocenose 11; 1100 m.

Croton oblongifolius Roxb., phytocenoses 1, 3, 4, common in 2; 310-512 m.

Croton spp., infrequent in phytocenoses 3, 7, 11; 825-1160 m.

Flueggea sp., infrequent in phytocenose 4; 512 m.

Mallotus barbatus Meull., phytocenose 11; 1160-1540 m.

Mallotus spp., phytocenoses 1, 2, 7, 11; 380, 950-1200 m.

Phyllanthus emblica Linn., phytocenoses 1, 3, infrequent in 4, 5, common in 8, 9, 10; 365-1685 m.

Phyllanthus spp., phytocenoses 3, 8, 10, infrequent in 1, common in 7, 11; 920-1220 m.

Putranjiva roxburghii Wall., phytocenose 1; 380 m.

Sapium baccatum Roxb., phytocenoses 7, 11, infrequent in 3; 825-1325 m.

Sapium insigne Benth., phytocenose 1, infrequent in 4; 310-512 m.

Sauropus androgynus Merr., infrequent in phytocenose 5; 480 m.

Sauropus sp., phytocenose 11; 1160-1220 m.

Anacardiaceae

Bouea gandaria Bl., infrequent in phytocenose 1; 310 m.

Bouea oppositifolia Meissn., infrequent in phytocenose 1; 380 m.

Buchanania sp., phytocenose 5, infrequent in 3; 422-540 m.

Gluta obovata Craib, infrequent in phytocenose 1; 330 m.

Mangifera indica Linn., infrequent in phytocenose 1; 310 m.

Mangifera sp., infrequent in phytocenose 7; 775-800 m.

Melanorrhoea usitata Wall., phytocenoses 1, 3, 4, 7, 8, 10, common in 5, infrequent in 11; 320-1115 m.

Poupartia axillaris King & Prain, phytocenose 11, infrequent in 7; 955-1325 m.

Semecarpus cochinchinensis Engl., phytocenoses 8, 11, infrequent in 1, 3, 5, common in 7; 825-1250 m.

Spondias pinnata Kurz, phytocenoses 1, 2, 3, 5, common in 4; 310-825 m.

Aquifoliaceae

Ilex sp., phytocenoses 3, 5, infrequent in 11; 350-1020 m.

Celastraceae

Celastrus paniculatus Willd., phytocenoses 1, 2, 3, 4, 5; 320-725 m.

Euonymus cochinchinensis Pierre, infrequent in phytocenose 1; 400 m.

Lophopetalum wallichii Kurz, phytocenoses 3, 5, infrequent in 1; 1400-890 m.

Siphonodon celastrineus Griff., phytocenose 2; 385 m.

Staphyleaceae

Turpinia nepalensis Wall., phytocenose 10, common in 7, 11; 950-1540 m.

Sapindaceae

Euphoria longana Steud., infrequent in phytocenose 1; 310 m.

Harpullia arborea Radlk., phytocenoses 1, 2, 3, 4, 11; 950-1020 m.

Nephelium sp., phytocenoses 7, 11; 775-1200 m.

Sapindus rarak DC., infrequent in phytocenose 11; 1200 m.

Schleichera oleosa Merr., phytocenoses 1, 3, 4; 310-710 m.

Xerospermum sp., phytocenoses 3, 7, 11; 775-1220 m.

Sabiaceae

Meliosma simplicifolia (Roxb.) Walp., phytocenose 11, common in 7;950-1250m.

Rhamnaceae

Ventilago calyculata Tul., phytocenoses 1, 2, 3, infrequent in 4, 7; 380-480, 970 m.

Zizyphus jujuba Lam., infrequent in phytocenose 1; 310 m.

Zizyphus oenoplia Mill., phytocenoses 1, 2, 4; 365-512 m.

Zizyphus rugosa Lamk., phytocenoses 1, 3, 4, 5, 8; 310-890 m.

Vitaceae

Ampelocissus sp., infrequent in phytocenose 11; 950 m.

Cissus japonica (Thunb.) Merr., infrequent in phytocenose 11; 1010 m.

Cissus sp., infrequent in phytocenoses 8, 11; 950-1115 m.

Columella pedata Lour., phytocenose 7, infrequent in 11; 950-1325 m.

Columella tenuifolia Merr., phytocenose 11, infrequent in 1; 380, 1220-1310 m.

Leea spp., phytocenoses 1, 3, 5, 8, 10, 11, infrequent in 4, common in 7; 380-1410 m.

Tetrastigma lanceolarum Planch., phytocenoses 7, 8, 11; 775-1540 m.

Tetrastigma sp., infrequent in phytocenose 7; 955 m.

Vitis sp., infrequent in phytocenose 7; 955 m.

Elaeocarpaceae

Elaeocarpus siamensis Craib, phytocenoses 1, 2, infrequent in 11; 310-400, 1250 m.

Tiliaceae

Colona auriculata (H. Baill. ex Pierre) Craib, phytocenose 2, infrequent in 1; 385-400 m.

Colona flagrocarpa (C.B. Clarke ex Brandis) Craib, phytocenose 5, infrequent in 4; 320-875 m.

Colona floribunda Kurz, phytocenose 5, infrequent in 1, 4; 320-430, 710 m.

Colona sp., phytocenose 4, infrequent in 8; 480-1000 m.

Grewia aspera Roxb., phytocenoses 5, 8, infrequent in 1, 4, 7; 365-1060 m.

Grewia elastostemoides Collet & Hemsl., infrequent in phytocenoses 4, 5, 7; 710-920 m.

Grewia lacei Drumm. & Craib, phytocenoses 3, 5, 8, 10, infrequent in 1; 350-1410 m.

Grewia microcos Linn., phytocenose 2, infrequent in 1, 4; 380-512 m.

Grewia spp., phytocenose 4, infrequent in 1, 11, common in 2; 380-640 m.

Triumfetta pilosa Roth., phytocenose 10; 1616-1685 m.

Malvaceae

Hibiscus sp., infrequent in phytocenose 5; 430 m.

Sida acuta Burm. f., infrequent in phytocenose 1, common in 2; 380-390 m.

Thespesia lampas Dalz. & Gibs., phytocenoses 2, 3, 4, 5, infrequent in 1; 320-890 m.

Urena lobata Linn., phytocenose 10, common in 2, infrequent in 5; 350-390, 1685 m.

Urena rigida wall. ex Masters, phytocenose 8, infrequent in 4, 5; 520-1000 m.

Bombacaceae

Bombax anceps Pierre var. *cambodiense* (Pierre) A. Robyns, phytocenoses 3, 4, 5, infrequent in 1; 365-890 m.

Bombax ceiba Linn., phytocenoses 1, 4; 380-640 m.

Bombax insigne Wall., infrequent in phytocenose 1; 310 m.

Bombax sp., phytecenose 2, infrequent in 3; 385, 825 m.

Ceiba pentandra Gaertn., infrequent in phytocenose 1; 380 m.

Sterculiaceae

Helicteres hirsuta Lour., phytocenoses 3, 5, infrequent in 1, 4; 320-1020 m.

Helicteres isora Linn., infrequent in phytocenose 3; 520 m.

Pterospermum sp., infrequent in phytocenose 7; 970 m.

Sterculia lanceolata Cav., phytocenoses 7, 11; 920-1310 m.

Sterculia ornata Wall., phytocenoses 3, 4, 5; 422-975 m.

Sterculia sp., infrequent in phytocenose 7; 970 m.

Sterculia thorelii Pierre, phytocenose 2; 390 m.

Waltheria americana Linn., infrequent in phytocenose 1; 400 m.

Dilleniaceae

Dillenia obovata (Bl.) Hoogl., phytocenose 7; 950-990 m.

Dillenia parvifolia Martelli, phytocenoses 1, 2, 3, 5, 7, 8, 10, 11; 330-1410 m.

Dillenia pentagyna Roxb., infrequent in phytocenoses 4, 5; 640-890 m.

Saurauia thorelii Finet & Gagnep., phytocenose 11; 1160-154 m.

Ochnaceae

Ochna wallichii Planch., phytocenoses 3, 5, 8, infrequent in 1; 320-1110 m.

Theaceae

Adinandra phlebophylla Hance, phytocenoses 7, 11; 920-1325 m.

Anneslea fragrans Wall., phytocenoses 7, 10, infrequent in 1, 11; common in 5, 8, 9; 320-1600 m.

Camellia confusa Stuart, phytocenose 11; infrequent in 7; 955-1200 m.

Eurya acuminata DC., phytocenoses 10, 11; 1020-1685 m.

Eurya japonica Thunb. var. *nitida* Dyer, phytocenose 9; 1520 m.

Eurya japonica Thunb. var. *siamensis* Craib, infrequent in phytocenose 11; 1540 m.

Gordonia dalglieshiana Craib, infrequent in phytocenose 11; 1540 m.

Pyrenaria camelliaeflora Kurz, phytocenose 11; 1220-1540 m.

Schima wallichii Choisy, phytocenoses 8, 10, infrequent in 3, common in 7, 11; 775-1600 m.

Ternstroemia japonica Thunb., phytocenoses 7, 10, infrequent in 3, 11; 825-1685 m.

Guttiferae

Calophyllum sp., infrequent in phytocenose 11; 1160 m.

Cratoxylon formosum Benth. & Hook. f., infrequent in phytocenoses 1, 5; 330-350 m.

Cratoxylon polyanthum Korth., phytocenoses 1, 2, 3, infrequent in 4, 5, 7; 390-800 m.

Cratoxylon pruniflorum Kurz, phytocenose 4; 512-640 m.

Garcinia cowa Roxb., phytocenoses 5, 7, 11, infrequent in 1; 320-1160 m.

Garcinia sp. phytocenoses 5, 7, infrequent in 11; 380, 875-1160 m.

Garcinia thorelii Pierre, infrequent in phytocenose 7; 970 m.

Garcinia vilersiana Pierre, infrequent in phytocenose 11; 1200 m.

Mesua ferrea Linn., phytocenose 7; 955-970 m.

Ochrocarpus siamensis T. Anders., phytocenoses 1, 5; 320-400 m.

Dipterocarpaceae

Dipterocarpus alatus Roxb., phytocenose 1; 320 m.

Dipterocarpus costatus Gaertn. f., common in phytocenose 7, infrequent in 11; 920-1200 m.

Dipterocarpus obtusifolius Teysm., phytocenose 3, infrequent in 4, 7, common in 5, 8; 320-1115 m.

Dipterocarpus tuberculatus Roxb., phytocenoses 1, 3, 5, 8, infrequent in 4; 320-1115 m.

Dipterocarpus turbinatus Gaertn. f., infrequent in phytocenose 3; 825 m.

Hopea odorata Roxb., infrequent in phytocenose 11; 970 m.

Pentacme suavis A. DC., phytocenoses 1, 4, 8, common in 3, 5; 350-1115 m.

Shorea obtusa Wall., phytocenoses 4, 10, common in 3, 5, 8; 320-1190 m.

Shorea talura Roxb., phytocenoses 1, 3, 8, 10, infrequent in 5; 320-1200 m.

Violaceae

Rinorea sp., infrequent in phytocenoses 7, 8; 955-975 m.

Viola serpens Wall., infrequent in phytocenose 11; 1540 m.

Flacourtiaceae

Casearia grewiaefolia Vent., phytocenoses 3, 4, common in 1, infrequent in 5; 310-710 m.

Flacourtia spp., phytocenose 3, infrequent in 5, 8; 380-1020 m.

Scolopia sp., phytocenose 5; 350-600 m.

Datiscaceae

Tetrameles nudiflora R. Br., infrequent in phytocenose 1; 380 m.

Begoniaceae

Begonia inflata C. B. Clarke, phytocenose 11; 1160-1250 m.

Begonia sp., infrequent in phytocenose 7; 955 m.

Thymelaeaceae

Enkleia siamensis (Kurz) Nevling, infrequent in phytocenose 5; 540 m.

Linostoma pauciflorum Griff., phytocenose 5, infrequent in 4; 430-640 m.

Lythraceae

Lagerstroemia balansae Koehne, phytocenoses 1, 2, 3. 4, infrequent in 5; 365-890 m.

Lagerstroemia calyculata Kurz, phytocenose 5, infrequent in 1, 4; 310-600 m.

Lagerstroemia loudonii Teijsm. & Binn., infrequent in phytocenose 2; 385 m.

Lagerstroemia macrocarpa Wall. ex Voigt, phytocenoses 1, 3, infrequent in 4; 400-430, 710 m.

Lagerstroemia villosa Wall. ex Kurz, phytocenoses 1, 2, 4; 390-688 m.

Sonneratiaceae

Duabanga grandiflora (Roxb. ex DC.) Walp., infrequent in phytocenoses 3, 7, 11, 825-1020 m.

Lecythidaceae

Careya arborea Roxb., phytocenoses 3, 4, common in 1, infrequent in 5; 310-725 m.

Rhizophoraceae

Carallia lucida Roxb., phytocenose 11; 1250-1325 m.

Nyssaceae

Nyssa javanica (Bl.) Wang, infrequent in phytocenose 7, common in 11; 950-1540 m.

Alangiaceae

Alangium salviifolium Wang, phytocenoses 1, 2, 4; 380-512 m.

Combretaceae

Anogeissus acuminata Wall. var. *lanceolata* C. B. Clarke, phytocenoses 1, 4, common in 2; 380-688 m.

Calycopteris floribunda Lam., phytocenose 1, common in 2, infrequent in 11; 310-390, 1200 m.

Combretum latifolium G. Don, infrequent in phytocenose 1; 380 m.

Combretum sp., phytocenoses 2, 3, 4, 7, 8, infrequent in 1, 11; 380-1200 m.

Quisqualis indica Linn., infrequent in phytocenose 1; 380 m.

Terminalia alata Heyne, phytocenoses 1, 3, 4, 5, 8; 320-1000 m.

Terminalia bellerica Roxb., phytocenose 1, infrequent in 5; 380-680 m.

Terminalia chebula Retz., phytocenose 5, infrequent in 1; 310-650 m.

Terminalia mucronata Craib & Hutch., phytocenoses 5, 7, 8, common in 3, 4; 365-1010 m.

Terminalia tripteroides Craib, phytocenoses 1, 3, 4; 400-520 m.

Myrtaceae

Eugenia albiflora Duthie, phytocenose 11; 1020 m.

Eugenia cumini Druce, phytocenoses 1, 2, 3, 5, infrequent in 7, 8; 310-1060 m.

Eugenia euneura Craib, infrequent in phytocenose 11; 1325 m.

Eugenia grata Wight, infrequent in phytocenose 7; 920 m.

Eugenia grata Wight var. *collinsae* Craib, phytocenose 7; 800-1100 m.

Eugenia siamensis Craib, infrequent in phytocenose 8; 975 m.

Eugenia spp., phytocenoses 10, 11, infrequent in 3, 5, 7; 350, 775-1540 m.

Eugenia thumra Roxb., phytocenoses 8, 10, 11, common in 7; 920-1540 m.

Tristania rufescens Hance, phytocenoses 3, 10, infrequent in 1, common in 5, 8; 400-1190 m.

Melastomaceae

Melastoma normale D. Don, phytocenoses 7, 9, 10, infrequent in 1, 11; 920-1540, 330 m.

Memecylon plebejum Kurz, phytocenoses 3, 5, 7, 8, common in 11; 600-1540 m.

Memecylon scutellatum Hook. & Arn., phytocenoses 1, 3, 5; 320-540 m.

Osbeckia chinensis Linn., phytocenoses 3, 9, infrequent in 5; 320, 725, 1520 m.

Osbeckia pulchra Geddes, common in phytocenoses 9, 10; 1190-1600 m.

Sonerila nisbetiana Craib, phytocenose 9; 1500 m.

Onagraceae

Jussieua linifolia Vahl, phytocenose 2; 385 m.

Araliaceae

Aralia armata Seem., infrequent in phytocenose 11; 1020 m.

Brassiopsis speciosa Dcne. & Planch., infrequent in phytocenoses 7, 11; 955-1200 m.

Schefflera cuneata Craib, phytocenose 11, infrequent in 7; 955-1325 m.

Trevesia palmata Vis., phytocenose 7, infrequent in 11; 920-970 m.

Umbelliferae

Bupleurum tenue Buch.-Ham. ex D. Don, infrequent in phytocenose 5; 680 m.

Ericaceae

Agapetes hosseana Diels, phytocenose 10, infrequent in 11; 1410-1600 m.

Craibiodendron stellatum (Pierre) W. W. Sm., phytocenoses 3, 8, 9, 10, common in 5; 320-1500 m.

Lyonia ovatifolia (Wall.) Drude, phytocenose 9; 1520 m.

Rhododendron moulmainense Hook., infrequent in phytocenose 11; 1540 m.

Vaccinium sprengelii (D. Don) Sleum, phytocenoses 3, 5, 8, infrequent in 7, common in 9, 10; 600-1600 m.

Sapotaceae

Madhuca sp., phytocenose 7, infrequent in 11; 955, 1250 m.

Planchonella sp., infrequent in phytocenose 11; 1020 m.

Ebenaceae

Diospyros ehretioides Wall., phytocenoses 1, 3, 4, 5; 320-875 m.

Diospyros ferrea Bakh., infrequent in phytocenose 11; 1020 m.

Diospyros glandulosa Lace, phytocenoses 10, 11, infrequent in 7; 955, 1310-1600 m.

Diospyros mollis Wall., infrequent in phytocenose 4; 480 m.

Diospyros siamensis Hochr., infrequent in phytocenoses 1, 8, 11; 380, 950-1115 m.

Diospyros spp., phytocenoses 1, 7, infrequent in 4; 380-1010 m.

Diospyros winitii Fletcher, infrequent in phytocenose 11; 1020 m.

Styracaceae

Styrax benzoides Craib, phytocenoses 8, 10, 11, infrequent in 5, common in 7; 775-1540 m.

Oleaceae

Jasminum funale Dcne., phytocenose 1; 380-400 m.

Jasminum nervosum Lour., phytocenose 7, infrequent in 3, common in 11; 430, 775-1325 m.

Olea dioica Roxb., infrequent in phytocenose 11; 1325 m.

Olea maritima Wall., phytocenose 7, infrequent in 5; 600, 920-950 m.

Olea rosea Craib, infrequent in phytocenose 7; 1010 m.

Loganiaceae

Buddleia asiatica Lour., infrequent in phytocenose 11; 1540 m.

Strychnos nux-vomica Linn., phytocenoses 1, 3, 4, common in 5; 320-890 m.

Gentianaceae

Exacum sutaepense Hosseus, phytocenose 10; 1600 m.

Apocynaceae

Aganosma marginata G. Don, phytocenoses 3, 5, 8, infrequent in 1; 385-975 m.

Holarrhena antidysenterica (Roth.) Wall. ex DC., phytocenoses 1, 3, 4, infrequent in 5; 380-875 m.

Melodinus sp., infrequent in phytocenose 5; 600 m.

Rauwolfia verticillata (Lour.) Baill., phytocenose 7, infrequent in 5; 540, 955-990 m.

Winchia calophylla A. DC., phytocenoses 7, 11; 920-1160 m.

Wrightia tomentosa Roem. & Schult., infrequent in phytocenose 1; 310 m.

Asclepiadaceae

Cryptolepis buchanani Roem. & Schult., phytocenose 11; 1020-1200 m.

Dischidia minor (Vahl) Merr., phytocenoses 3, 5, infrequent in 4; 320-890 m.

Dischidia rafflesiana Wall., phytocenoses 3, 5; 320-890 m.

Gymnema griffithii Craib, phytocenose 2, infrequent in 5; 385-480 m.

Hoya kerrii Craib, phytocenose 3, infrequent in 1; 320-825 m.

Hoya parasitica (Roxb.) Wall. ex Wight, phytocenoses 3, 5, infrequent in 1; 320-890 m.

Streptocaulon juventas (Lour.) Merr., phytocenoses 3, 4, 5, 8, infrequent in 1; 350-1000 m.

Convolvulaceae

Argyreia obtecta (Choisy) C. B. Clarke, phytocenoses 8, 10, infrequent in 7, 11; 975-1540 m.

Argyreia sp., infrequent in phytocenose 5; 600 m.

Verbenaceae

Callicarpa arborea Roxb., infrequent in phytocenose 11; 1020 m.

Clerodendrum fragrans (Vent.) R. Br., phytocenose 1; 380-400 m.

Clerodendrum sp., phytocenose 1; 380-400 m.

Congea tomentosa Roxb , phytocenose 11, infrequent in 4; 480, 950-1200 m.

Gmelina arborea Roxb., phytocenose 1, infrequent in 4; 310-640 m.

Lantana camara Linn., infrequent in phytocenose 1; 330 m.

Premna nana Collet & Hemsl., phytocenoses 3, 5, 8; 422-1000 m.

Sphenodesma sp., infrequent in phytocenoses 1, 4, common in 2; 380-512 m.

Tectona grandis Linn. f., phytocenoses 1, 2, 5, common in 3, 4; 310-875 m.

Vitex canescens Kurz, phytocenoses 1, 3, 4; 330-710 m.

Vitex glabrata R. Br., phytocenoses 3, 4, 8, 10, infrequent in 1, 11, common in 5; 320-1190 m.

Vitex peduncularis Wall, ex Schauer, phytocenoses 1, 5, 8, common in 3, 4, infrequent in 7; 320-1000 m.

Labiatae

Anisomeles ovata R. Br., phytocenose 10, infrequent in 1; 330, 1410 m.

Colquhounia elegans Wall., infrequent in phytocenose 11; 1160 m.

Elsholtzia blanda Benth., phytocenose 10; 1616-1685 m.

Eurysolen gracilis Prain, phytocenose 11; 1200-1310 m.

Geniosporum coloratum Kuntze, phytocenoses 8, 10, infrequent in 3, 11; 725-1540 m.

Gomphostemma lucidum Wall., phytocenos 11; 1100-1325 m.

Gomphostemma wallichii Prain, phytocenoses 8, 10; 1110-1410 m.

Leucas mollissima Wall., phytocenose 10; 1410-1520 m.

Mesona parviflora Briq., phytocenose 5; 430-650 m.

Plectranthus hispidus Benth., phytocenose 10, infrequent in 11; 1000-1410 m.

Plectranthus sp., phytocenose 5; 600-680 m.

Plectranthus ternifolius D. Don, phytocenoses 8, 10; 1000-1410 m.

Pogostemon fraternus Miq., infrequent in phytocenose 11; 1220 m.

Solanaceae

Solanum indicum Linn., infrequent in phytoceneose 11; 1540 m.

Scrophulariaceae

Adenosma indianum (Lour.) Merr., infrequent in phytocenoses 1, 5; 350-400 m.

Alectra arvensis (Benth.) Merr., common in phytocenose 9; 1500-1520 m.

Buchnera cruciata Buch.-Ham., phytocenose 5; 540-680 m.

Lindernia crustacea F. Muell., phytocenose 9; 1520 m.

Sopubia trifida Buch.-Ham., phytocenose 9, infrequent in 5; 890, 1500-1520 m.

Striga masuria Benth., infrequent in phytocenose 5; 650 m.

Bignoniaceae

Heterophragma adenophyllum Seem., phytocenose 11; 1100-1220 m.

Markhamia stipulata Seem., phytocenoses 1, 2, 3, 4, 7, 11; 365-1200 m.

Mayodendron igneum Kurz, phytocenose 5, infrequent in 7; 775-890 m.

Oroxylum indicum Vent., phytocenose 1; 310-380 m.

Stereospermum chelonoides DC., phytocenose 5, infrequent in 1, 4, 10, 11; 400-1520 m.

Stereospermum fimbriatum DC., infrequent in phytocenose 11; 1310 m.

Stereospermum neuranthum Kurz, phytocenoses 3, 5, 8, 10, infrequent in 1, 7; 350-975 m.

Orobanchaceae

Aeginetia indica Roxb., phytocenoses 2, 10, 11, infrequent in 7, common in 9; 385, 990-1520 m.

Gesneriaceae

Lysionotus serrata D. Don, phytocenose 10; 1400-1600 m.

Rhynchotechum sp., infrequent in phytocenose 7; 955 m.

Acanthaceae

Andrographis laxiflora (Bl.) Lindau, infrequent in phytocenose 7; 970 m.

Barleria cristata Linn., phytocenoses 1, 4, 8, common in 3, 5; 320-1110 m.

Barleria siamensis Craib, infrequent in phytocenose 4; 640 m.

Barleria strigosa Willd., phytocenose 4, infrequent in 1; 409-688 m.

Eranthemum tetragonum Nees, phytocenoses 7, 11, infrequent in 1; 380-1310 m.

Justicia sp., infrequent in phytocenoses 7, 11; 970-1250 m.

Lepidagathis incurva Buch.-Ham. ex D. Don, infrequent in phytocenoses 7, 11; 990-1020 m.

Lepidagathis sp., infrequent in phytocenose 11; 1310 m.

Nelsonia canescens (Lam.) Spreng., infrequent in phytocenose 1; 380 m.

Neuracanthus tetragonostachyus Nees, infrequent in phytocenose 1; 380 m.

Phaylopsis dorsiflora (Retz.) Santapau, infrequent in phytocenose 1; 380 m.

Phlogacanthus curviflorus Nees, phytocenose 11, infrequent in 7; 950-1200 m.

Sericocalyx quadrifarius (Wall. ex Nees) Brem., phytocenoses 1, 2, 3, infrequent in 11; 380-825 m.

Strobilanthes incisus J. B. Imlay, phytocenoses 3, 5, 8, 10; 430-1410 m.

Strobilanthes rex C. B. Clarke, infrequent in phytocenose 5; 320, 680 m.

Strobilanthes sp., phytocenose 11, infrequent in 5, 10; 600, 1600-1540 m.

Thunbergia hossei C.B. Clarke, infrequent in phytocenoses 7, 11; 970, 1310 m.

Thunbergia laurifolia Lindl., phytocenoses 1, 2, 11, infrequent in 7; 380-390, 950-1020 m.

Rubiaceae

Anthocephalus cadamba Miq., phytocenoses 10, 11, common in 7; 920-1520 m.

Borreria stricta G. F. W. Mey, infrequent in phytocenose 5; 540 m.

Canthium horridum Bl., phytocenoses 3, 7, 10, 11; 422, 950-1520 m.

Canthium sp., infrequent in phytocenose 5; 540 m.

Chasalia ophioxyloides Craib, infrequent in phytocenose 7; 955 m.

Gardenia erythroclada Kurz, phytocenoses 2, 3, 4, 5; 365-640 m.

Gardenia obtusifolia Roxb., phytocenose 5, infrequent in 4; 350-890 m.

Gardenia sessiliflora Wall., phytocenose 1; 380-385 m.

Gardenia sootepensis Hutch., phytocenoses 3, 5, 8, infrequent in 4; 430-890 m.

Gardenia turgida Roxb., phytocenose 5, infrequent in 1; 320-430 m.

Hedyotis kerrii (Pitard) Craib, phytocenoses 5, 7, 10, common in 3, 8, 9; 350-1520 m.

Hymenodictyon excelsum Wall., phytocenoses 2, 3, infrequent in 4; 385-512 m.

Ixora butterwickii Hole var. *lepida* Craib, phytocenoses 7, 11; 920-1200 m.

Ixora cibdela Craib, infruquent in phytocenoses 4, 5, 11, 365-1160 m.

Ixora kerrii Craib, phytocenose 11; 1250-1325 m.

Ixora spp., infrequent in phytocenoses 3, 5, 7, 8, 11; 480-1100 m.

Lasianthus kurzii Hook., phytocenoses 7, 11; 950-1200 m.

Morinda angustifolia Roxb., phytocenose 11, infrequent in 4, common in 7; 710-1310 m.

Morinda coreia Buch.-Ham., phytocenose 3, infrequent in 5; 422-480 m.

Morinda sp., infrequent in phytocenose 4; 365 m.

Mussaenda kerrii Craib, phytocenoses 3, 5, 7, 8, 10, 11; 320, 600-1685 m.

Nauclea orientalis Linn., phytocenoses 1, 2, 3, 5, infrequent in 4; 380-600 m.

Neonauclea cf. *calycina* Merr., phytocenoses 7, 11, infrequent in 5; 385-1325 m.

Paederia pilifera Hook. f., phytocenose 5, infrequent in 1; 320-600 m.

Paederia sp., phytocenose 2; 385 m.

Psychotria sp., phytocenose 11; 1160-1200 m.

Randia siamensis Craib, phytocenoses 1, 3, infrequent in 7; 380-430, 950 m.

Randia sootepensis Craib, phytocenoses 3, 5, 7, 8; 775-1000 m.

Randia tomentosa Hook. f., phytocenoses 1, 2, 3, 4, common in 5; 320-890 m.

Wendlandia tinctoria DC., phytocenoses 8, 9, 10, 11 common in 3, 5, infrepuent in 7; 350-1540 m.

Caprifoliaceae

Viburnum inopinatum Craib, phytocenoses 7, 8, infrequent in 3, 11; 775-1110 m.

Cucurbitaceae

Alsomitra sp., infrequent in phytocenose 1; 400 m.

Luffa cylindrica M. Roem., phytocenose 2; 390 m.

Melothria heterophylla Cogn., infrequent in phytocenoses 4, 8; 688, 1000 m.

Compositae

Anaphalis margaritacea Benth., phytocenose 10, common in 9; 1500-1685 m.

Bidens pilosa Linn., infrequent in phytocenose 11; 1540 m.

Blumea balsamifera DC., phytocenose 10; 1520-1600 m.

Blumea clarkii Hook. f., infrequent in phytocenose 11; 1160 m.

Blumea fistulosa Kurz, phytocenoses 3, 8, 9, 10, common in 4, 5; 320-1520 m.

Elephantopus scaber Linn., phytocenoses 1, 3, infrequent in 7; 330-990 m.

Eupatorium odoratum Linn., phytocenoses 3, 5, common in 1, 2, 4, infrequent in 8, 10; 330-1190 m.

Gerbera piloselloides Cass., phytocenose 9; 1500 m.

Inula cappa DC., phytocenoses 5, 8, 10, infrequent in 4, common in 9; 320-1600 m.

Inula nervosa Wall., phytocenose 9; 1520 m.

Inula polygonata DC., phytocenoses 3, 5, 10, common in 8; 320-1115 m.

Lactuca sp., infrequent in phytocenose 11; 1540 m.

Laggera alata Sch. Bip. ex Oliver, phytocenose 10, common in 9; 1500-1685 m.

Laggera falcata Kuntze, peytocenoses 3, 5, 8, 9, 10; 650-1500 m.

Laggera pterodonta Sch. Bip. ex Oliver, phytocenose 10, infrequent in 11; 1540-1685 m.

Leucomeris decora Kurz, phytocenoses 8, 9; 1000, 1520 m.

Microglossa volubilis DC., phytocenose 10; 1600 m.

Senecio nagensium C. B. Clarke var. *lobbii* Craib, phytocenose 9, infrequent in 11; 1520-1540 m.

Tricholepis karensium Kurz, phytocenose 8, common in 9; 1060-1520 m.

Tridax procumbens Linn., infrequent in phytocenose 1; 330 m.

Vernonia cinerea Less., phytocenose 2, infrequent in 1, 7, 11; 385-1160 m.

Vernonia parishii Hook. f., phytocenoses 3, 5, 10, common in 7, 8, infrequent in 11; 600-1190 m.

Vernonia sp., phytocenoses 3, 5, 8, 10, 11; 480-540, 890-1540 m.

Vernonia volkameriaefolia DC., phytocenose 11; 950-1540 m.

Vicoa indica DC., phytoceneses 3, 8, 9, 10, common in 5; 320-1520 m.

Wedelia wallichii Less., infrequent in phytocenoses 1, 11, common in 2; 380-390, 1540 m.

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* The phytocenoses in which a species was sampled are indicated by the numbers referable to the text. *Infrequent* indicates that the species was sampled only once in that phytocenose. *Common* indicates that the species was sampled in more than 75% of the stands. Elevational range of occurrence follows.

The arrangement of the list is as follows :–

Gymnospermae and *Angiospermae* after Engler and Diels (1936). *Pteridophytes* after Holttum (1954). Only plants identified at least to genus are included in this list. Exotic species found in the non-cultural phytocenoses are included in this list.

Conclusion

The list contains some 679 species of vascular plants. They are distributed among the major subdivisions of the plant kingdom as follows :–

Plant group	Families	Genera	Species
Pteridophytes	9	22	34
Gymnospermae	5	5	6
Monocotyledoneae	16	79	113
Dicotyledoneae	94	343	526
Total	124	449	679

Due to the time of year when the collections were made many of the herbs and grasses were not in condition for accurate identifications. This problem became more severe as the dry season progressed and the burning intensified. Towards the latter part of the field work most of the lower elevation phytocenoses were already burned leaving only the trees and shrubs for sampling. Epiphytes were poorly sampled due to the time available.

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