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The Floristic Composition of Tropical Montane Forest in Doi Inthanon National Park, Northern Thailand, with Special Reference to Its Phytogeographical Relation with Montane Forests in Tropical Asia

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Abstract We present a preliminary report and phytogeographical analysis of the tree flora of tropical montane forest on Doi Inthanon based on an enumeration of all trees ≥1.0 cm in diameter at breast height in a 15-ha plot. We found 165 species in 106 genera and 58 families, and identified 126 species (77%). In terms of species richness, the Lauraceae had the most at family level with 25 species, and *Litsea* (Lauraceae) had the most at genus level with 9 species. In terms of basal area, the Fagaceae, Lauraceae and Cornaceae were the most dominant families, comprising respectively 20.0%, 15.1% and 11.8% of the total basal area. The most dominant species in the plot was *Mastixia euonymoides* Prain (Cornaceae). Of the 126 identified species, 75 (60%) are common to the Himalayas and 47 (37%) are common to Malesia. The floristic affinity to tropical montane forests in Malesia is relatively high at genus level. The dominance of the Lauraceae, Fagaceae and Magnoliaceae is common to the montane forests of southwestern China and the eastern Himalayas, but the forest of Doi Inthanon is richer in tropical elements.

Key words: tropical montane forests, tree flora, phytogeography, Fagaceae, Lauraceae, *Mastixia*.

Doi Inthanon is the highest peak (2565 m above sea level) in Thailand and is located near Chiang Mai, northern Thailand. Northern Thailand is mountainous, being the southernmost extension of the Himalayan foothills, which run from northeastern India to Yunnan, China. The montane flora of this area is interesting from the phytogeographical viewpoint, because the area lies near the northern limit of Asian tropical flora, the southern limit of Asian temperate flora, the eastern limit of Himalayan flora and the western limit of Indochinese flora. However, the montane forests of northern Thailand have been severely deforested over the last 30 years, and natural forests remain mainly in nation-

al parks as scattered patches. The flora and vegetation of these montane forests are still only poorly understood, although there are some sketches of the mountain flora and vegetation in this area (Smitinand, 1966; Robbins and Smitinand, 1966; Maxwell *et al.*, 1995, 1997), and some studies on vegetation zonation by altitude in the area (Santisuk, 1988; Maxwell and Elliot, 2001).

We established a forest dynamics plot of 15 ha in the montane forest on the middle slope (*ca.* 1700 m altitude) of Doi Inthanon, and have finished the first measurements and species identification of every tree ≥ 1.0 cm in diameter at breast height in the whole plot. In this paper, we report on the tree flora only and its geographical aspects. Taxonomic examination of species is still going on for both the tree flora and the ground flora. We examine the phytogeographical relation of this forest to montane forests in other regions of tropical Asia.

The Study Area

The study area is located on the middle slope (18°31′N, 98°30′E, *ca.* 1700 m altitude) of Doi Inthanon, Chiang Mai Province, northern Thailand (Fig. 1). Doi Inthanon is located 50 km south-southwest of Chiang Mai City. An area of 482 km^2 around the summit has been designated a national park.

The area has a typical monsoon climate characterized by the alternation of dry and rainy seasons. The rainy season usually starts in May and ends in October. The rain is brought by the humid southwest winds blowing across the Indian Ocean. According to weather records at the Royal Project Doi Inthanon Station (1300 m altitude) from 1993 to 1999, the mean annual rainfall is 1908 mm, of which 88% falls in the six months of the rainy season. During the dry season, cold dry winds from the northeast prevail. The monthly rainfall from December to February is less than 10 mm in normal years. The monthly mean of the daily maximum temperatures ranges from 22.7℃ in December to 28.9℃ in April, and that of the daily minimum temperatures ranges from 11.4℃ in January to 18.6℃ in May.

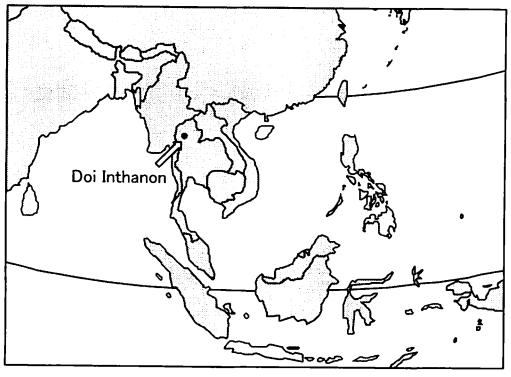

Fig. 1. Location map of the study area.

Rainfall and humidity clearly increase with altitude. The summit of Doi Inthanon (2565 m a.s.l.) is often covered with clouds, even in the dry season. At the weather station on the summit, the mean annual rainfall from 1982 to 1999 reached 2279 mm. The monthly mean of the daily maximum temperatures ranges from 17.3℃ in August to 21.4℃ in April, and that of the daily minimum temperatures ranges from 2.9℃ in December to 10.2℃ in August.

By interpolation, we can estimate that the monthly mean of the daily maximum temperatures at 1700 m ranges from 21.5℃ in December to 26.3℃ in April, and that of the daily minimum temperatures ranges from 8.9℃ in January to 15.5℃ in August. We also estimated the mean annual temperature and the warmth index (WI; Kira, 1948) at 1700 m as 18.4℃ and 161.3℃·month.

Santisuk (1988) recognized two vegetation zones by altitude in the mountains of northern Thailand: lowland (0–1000 m) and montane (>1000 m). He recognized two vegetation types in the montane zone: Upper Montane Forest and Lower Montane Forest. The boundary between the two is gradual but lies around 1800 m in altitude. Ohsawa (1993) recognized three vegetation zones by altitude in the tropical mountains of Asia: lowland (0–1000 m), lower montane (1000–2500 m) and upper montane (>2500 m). According to both classifications, our research plot is located in the lower montane zone, where lauro-fagaceous forest is predominant.

Methods

In December 1996, we established a research plot of 15 ha (300 m×500 m) in a

mature and well-protected forest at *ca.* 1700 m altitude. The plot includes small streams and a gentle ridge. The altitudinal difference between the highest and lowest points in the plot is 79.6 m. Every tree in the plot ≥ 1.0 cm DBH (diameter at 1.3 m above the ground) has been tagged, measured for DBH and mapped. We followed the methods standardized by the Center for Tropical Research Forest Science in the Smithsonian Tropical Research Institute (Condit, 1998).

Except for very common and clearly distinguishable species where it was certain that there would be no confusion, we collected branchlet or leaf specimens from every tree by using extensible branch cutters or slingshot. These specimens were sorted into morphospecies in the laboratory and then compared with botanical specimens with flowers and fruits, collected in the plot and from the surrounding area, to determine taxonomic species.

Botanical specimens were identified by reference to specimens from herbaria in Thailand (Royal Forest Department, Bangkok; Queen Sirikit Botanic Garden, Chiang Mai; Chiang Mai University, Chiang Mai) and in Japan (Kyoto University, Kyoto; University of Tokyo, Tokyo), and by referring to the *Flora of Thailand* (1970–2001). For families not yet revised in the *Flora of Thailand*, the floras of neighboring countries or areas were used: the *Flora of British India* (1872–1897), *Flora Republicae Popularis Sinicae* (1959–1999, in Chinese), *Flora of China* (1994–2000), *Flora Yunnanica* (1977–2000), *Flora of Bhutan* (1983–2001), *Flora of West Pakistan* (1970–2001), *Flore du Cambodge, du Laos et du Viêtnam* (1960–1985), *Tree Flora of Malaya* (1972–1989), and *Flora Malesiana*, ser. I (1950–1997). Taxonomic revisions for particular taxa were also consulted. Geographic distributions of each species were also surveyed from these literatures. Scientific names and major references used for identification are listed in Appendix 1. Voucher specimens have been placed in the Herbarium of the Natural History Museum and Institute, Chiba, Japan. Duplicate specimens were sent to the Royal Forest Department and Chiang Mai University. For voucher specimens, the Chiba accession number and the Doi Inthanon collection number are also listed in Appendix 1.

Results

1. Basal area and trunk density

The total basal area of the plot was 40.7 m^2 per ha. The trunk density was 5944 per ha for trees ≥ 1.0 cm DBH and 1804 per ha for trees ≥ 10.0 cm DBH. The tallest trees in the plot reached more than 50 m tall and the maximum DBH reached 176.7 cm.

2. Floristic composition at family and genus level

Taxonomic examination of species is still in progress. However, we found 165 species in 106 genera and 58 families, and identified 126 species (77% of the total, Appendix 1).

In terms of species richness, the Lauraceae was the most dominant family, represented by 25 species in 9 genera (Table 1). It was followed by the Rubiaceae (13 species in 8 genera), Myrsinaceae (11 species in 5 genera), Euphorbiaceae (8 species in 7 genera) and Fagaceae (8 species in 3 genera).

Strictly tropical families were rare in the plot. The Dipterocarpaceae was absent, and the Myristicaceae, Annonaceae, Burseraceae and Sapotaceae each had only one or two species. Temperate families such as the Aceraceae and Betulaceae also occurred. One gymnosperm, *Podocarpus neriifolius* D. Don (Podocarpaceae), was seen.

At genus level, *Litsea* (Lauraceae) showed the highest species richness—9 species (Table 2)—followed by *Prunus* (Rosaceae, 5 species), *Ardisia* (Myrsinaceae, 4 species) and *Lasianthus* (Rubiaceae, 4 species). Eighty-

Table 1. Largest families in the research plot.

Family	No. of species	No. of genera
Lauraceae	25	9
Rubiaceae	13	8
Myrsinaceae	11	5
Euphorbiaceae	8	7
Fagaceae	8	3
Rosaceae	6	2
Theaceae	5	4
Moraceae	5	3
Icacinaceae	4	4
Meliaceae	4	3
Rutaceae	4	3

Table 2. Largest genera in the research plot.

Genus	No. of species	Family
Litsea	9	Lauraceae
Prunus	5	Rosaceae
Ardisia	4	Myrsinaceae
Lasianthus	4	Rubiaceae
Strobilanthes	3	Acanthaceae
Elaeocarpus	3	Elaeocarpaceae
Castanopsis	3	Fagaceae
Lithocarpus	3	Fagaceae
Beilschmiedia	3	Lauraceae
Cinnamomum	3	Lauraceae
Ficus	3	Moraceae
Psychotria	3	Rubiaceae
Symplocos	3	Symplocaceae

Table 3. Top ten families of relative basal area in the research plot.

Family	Relative basal area (%)
Fagaceae	20.0
Lauraceae	15.1
Cornaceae	11.8
Euphorbiaceae	8.4
Magnoliaceae	5.8
Guttiferae	5.3
Myrtaceae	4.2
Rubiaceae	2.8
Nyssaceae	2.4
Oleaceae	1.9

four genera (74%) had only one species in the plot.

In terms of basal area, the Fagaceae, Lauraceae and Cornaceae were the most dominant families, comprising respectively 20.0%, 15.1% and 11.8% of the total basal area (Table 3). In terms of trunk density, the Lauraceae, Euphorbiaceae, Fagaceae and Rubiaceae were the most abundant (Table 4).

Table 4. Top ten families of relative density of trunks in the research plot.

Family	Relative density (%)
Lauraceae	14.3
Euphorbiaceae	13.2
Fagaceae	12.3
Rubiaceae	11.5
Guttiferae	6.8
Myrtaceae	4.6
Theaceae	4.5
Myrsinaceae	3.8
Meliaceae	3.5
Rutaceae	3.3

3. Dominant species in the plot

The most dominant species in the plot was *Mastixia euonymoides* Prain (Cornaceae), comprising 11.8% of total basal area in the plot (Table 5), followed by *Quercus eumorpha* Kurz (8.4%, Fagaceae), *Manglietia garretii* Craib (5.8%, Magnoliaceae) and *Calophyllum polyanthum* Wall. (5.3%, Guttiferae). In addition to these four species, *Quercus brevicalyx* A. Camus, *Nyssa javanica* Wang and *Drypetes indica* (Muell.-Arg.) Pax & Hoffm. var. *indica* reached a maximum DBH of $\geq$100 cm. Except for the two *Quercus* species, species belonging to the Fagaceae and Lauraceae did not reach the biggest size ($\geq$100 cm in DBH), although these two families shared the largest portion of basal area in the stand at family level.

Table 5. Top ten species of relative basal area in the research plot.

Species	Relative basal area (%)	Max. DBH (cm)	Family
Mastixia euonymoides	11.8	176.7	Cornaceae
Quercus eumorpha	8.4	102.8	Fagaceae
Manglietia garretii	5.8	157.5	Magnoliaceae
Calophyllum polyanthum	5.3	102.9	Guttiferae
Quercus brevicalyx	3.7	120.0	Fagaceae
Cryptocarya densiflora	3.4	66.2	Lauraceae
Syzygium angkae	2.5	69.5	Myrtaceae
Drypetes sp.	2.4	77.7	Euphorbiaceae
Nyssa javanica	2.4	134.1	Nyssaceae
Mallotus khasianus	2.3	38.3	Euphorbiaceae

4. Classification of phytogeographical distribution pattern

As shown in Appendix 2, for all 126 species identified, geographic distributions were clarified from the literature and were classified into eight types as follows. In the analysis, subspecies were distinguished but varieties were not.

Type 1, species endemic to Thailand.

Type 2, species reported from only a part of Myanmar (Burma), Thailand and south-central (SC) China (southeastern Xizang, Yunnan, southern Sichuan, Guichou, Guangxi and Hainan). One species reaches Guangdong.

Type 3, species distributed from the eastern Himalayas (eastern Nepal, India, Bangladesh, Bhutan and Sri Lanka) to Thailand and SC China, but not reported from Indochina (Laos, Cambodia and Vietnam). One species reaches the western Himalayas (Pakistan).

Type 4, species distributed from the eastern Himalayas to Indochina and SC or southeastern (SE) China (Guangdong, Hunan, Jiangxi, Fujian and Zhejiang). One species reaches Taiwan.

Type 5, species confined to continental Southeast Asia (Myanmar, Thailand, Laos, Cambodia, Vietnam, SC China and SE China), but not reported from the eastern Himalayas. Four species reach Taiwan and Japan.

Type 6, species distributed from the eastern Himalayas to Malesia (Malaysia, Philippines, Indonesia and New Guinea). Three species reach Taiwan or Japan. They are usually called Indo-Malesian elements.

Type 7, species distributed from Myanmar or Thailand to Malesia, but not reported from the eastern Himalayas.

Type 8, species distributed from the eastern Himalayas to Oceania through Malesia.

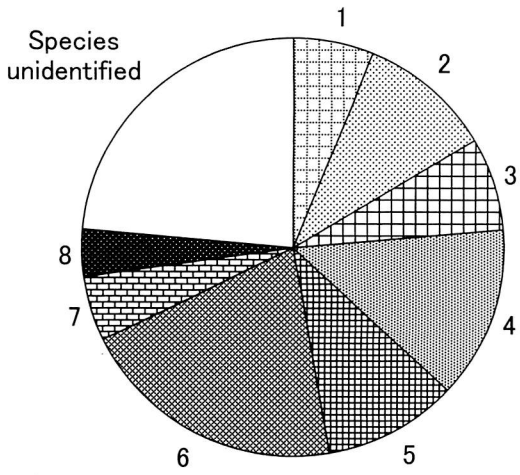

Fig. 2. Composition of geographic distribution types for 165 species occurring in the research plot. For explanations of each ditribution type (1–8), refer text and Appendix 2.

5. Composition of distribution types

Of the 126 species identified, 74 (59%) are common to the Himalayas (Types 3, 4, 6 and 8), and 48 (38%) are common to Malesia (Types 6, 7 and 8).

As shown in Figure 2, Type 6 has the largest number (34 species), followed by Type 4 (22 species). Type 2 is the third-largest (17 species), but this might be overestimated: Six species in the Lauraceae are included in this type, but taxonomic study of this family is still not sufficient in many neighboring countries except China. Only 10 species (Type 1) are endemic to Thailand.

Each distribution type was not biased to particular taxa but was composed of various families and genera. For example, the largest type, Type 6, was composed of 32 genera in 26 families, and the second-largest, Type 4, of 20 genera in 18 families.

Discussion

1. Characteristic features of the forest

Our results reveal that the montane forest on Doi Inthanon in northern Thailand contains many elements common to the Himalayas, Malesia and other areas of tropical Asia. Taxonomic revision is not sufficient in these areas for many plant families. Thus, the distributions suggested in this study are still tentative. However, recent studies have revealed that the continental part of tropical Asia has more elements common to the Malesian part of tropical Asia than previously expected (Zhu, 1997; Zhu *et al.*, 2000). Thus, future taxonomic study in tropical Asia might reveal closer floral relationships within the area, especially between the continental and Malesian parts.

The dominance of the Fagaceae (20.0% of total basal area) and Lauraceae (15.1%) is one of the characteristic features of this forest. This feature is common to evergreen broad-leaved forests at higher latitudes. These "lucidophyllous forests" (Kira, 1977) are widely distributed northwards to eastern China, southern Korea and southern Japan. Tagawa (1995) included tropical montane forest in Southeast Asia in the Lucidophyll Oak–Laurel Forest Formation together with lucidophyllous forests at higher latitudes. However, the high species richness of the Lauraceae that we observed appears to be much higher than that of lucidophyllous forests at higher altitude: e.g. 8 species in a 4-ha plot in the Tsushima Islands, southwestern Japan (Manabe *et al.*, 2000). The species richness of the Lauraceae in the research plot is lower than that in a lowland rain forest in Pasoh, Peninsular Malaysia (48 spp. in a 50-ha plot), but is almost comparable to that of the Dipterocarpaceae here (30 spp.; Kochummen *et al.*, 1990).

Another characteristic feature of this forest is the occurrence of big trees belonging to several families except the Fagaceae and Lauraceae. *Mastixia euonymoides* was the most dominant species in the plot, covering 11.8% of the total basal area. The maximum DBH of this species reached 176.7 cm. *Manglietia garretii* (Magnoliaceae), *Calophyllum polyanthum* (Guttiferae) and *Nyssa javanica* (Nyssaceae) also had big trees and shared a relatively large portion of the basal area.

Information on the floristic composition of tropical montane forests in tropical Asia is still limited, and thus accurate comparison of the floristic composition of these forests among areas is still difficult. However, we have made preliminary comparisons to montane forests in several neighboring areas.

2. Affinity to tropical montane forest in Malesia

There is little comparable data on the flora of tropical montane forests in Malesia. Meijer (1959) reported the flora of a 1-ha plot in a montane rain forest (1450–1500 m altitude) near Tjibodas, West Java. He recorded 58 species in 44 genera of trees >10 cm in DBH. We found two of the same species (*Engelhardtia spicata* Lesch. ex Blume and *Ostodes paniculata* Blume) and 25 of the same genera (*Acer, Antidesma, Castanopsis, Elaeocarpus, Engelhardtia, Eurya, Ficus, Glochidion, Ilex, Lindera, Litsea, Machilus, Manglietia, Neolitsea, Neonauclea, Ostodes, Phoebe, Polyosma, Quercus, Symplocos, Syzygium, Tarenna, Turpinia, Viburnum* and *Wendlandia*) in our plot. *Schima wallichii* (DC.) Korth., which grew in Meijer's plot, was not found in our plot, but was common on disturbed sites around our plot. Among the treelets and shrubs with a DBH of <10 cm in Meihjer's plot, one species (*Dichroa febrifuga* Lour.) and 20 genera (*Alangium, Ardisia, Brassiopsis, Cryptocarya, Dichroa, Elaeagnus, Embelia, Euonymus, Ficus, Glochidion, Lasianthus, Litsea, Macaranga, Michelia, Mycetia, Olea, Podocarpus, Psychotria, Pyrenaria* and *Rapanea*) were common to our plot. In total, 42 genera (40%) of the Doi Inthanon forest were common to the Tjibodas forest.

The stratification of the forest also appears similar between both plots. Both forests have emergent trees over a continuous canopy formed mainly by the Fagaceae and Lauraceae. In Meijer's plot, *Altingia excelsa* Noronha occurred as emergent trees; the second layer was formed by *Schima wallichii*, *Engelhardtia spicata* and species of the Fagaceae; below these layers, many other species were found. In our plot, *Mastixia euonymoides, Nyssa javanica* and *Manglietia garretii* occurred as the biggest trees; the second layer was formed by *Calophyllum polyanthum* and many species of the Fagaceae and Lauraceae; and below these layers many other species were found.

3. Affinity to montane forests in Myanmar and the eastern Himalayas

Floristically, montane forests in northern Myanmar perhaps have the closest affinity to the forest in our plot. However, information on forests of this area is rare except for some old literature. Kingdon-Ward (1945) recognized Subtropical Hill Jungle as a climax formation between 900 m and 1500 m in altitude, which was distinguished as the zone of the Magnoliaceae and Lauraceae. This forest zone seems to correspond roughly with the Lower Montane Forest zone of Santisuk

(1988) in northern Thailand. Kingdon-Ward (1945) recorded many species and genera which are common to our plot, such as *Engelhardtia spicata, Castanopsis, Lithocarpus, Lindera* and *Litsea*. Forest of the same type was referred to as Subtropical Wet Hill Forest by Hundley (1961) and Subtropical Moist Hardwood Forest by Davis (1964). Stamp (1925) also reported on the flora of mountain oak forest in Myanmar, but it appears that he studied drier forests.

The vegetation of Bhutan was described by Ohsawa (1987, 1991). According to Ohsawa, the climax forest in the subtropical zone between 1000 and 2000 m altitude is lauro-fagaceous forest, which also has some elements of tropical montane forests such as *Altingia excelsa, Engelhardtia spicata, Schima wallichii* and *Exbucklandia populnea* (Griff.) R. W. Brown (*Syn.*=*Symingtonia populnea* (Griff.) van Steenis) as emergent trees. These features are common to tropical montane forests in Java and on Doi Inthanon, as mentioned earlier. However, many Indo-Malesian elements are absent from Bhutan. Thus, we expect tropical elements to share only a small portion of the flora of the forest there.

4. Affinity to montane forests in southwestern China

According to the *Vegetation of Yunnan* (Editorial Committee of Vegetation of Yunnan, 1987), the Montane Monsoon Evergreen Broad-leaved Forest appears to correspond with the Lower Montane Forest of northern Thailand. This forest type is seen from 1300 m to 1750 m altitude, and is characterized by the occurrence of *Castanopsis hystrix* Hook. f. & Thomson ex A. DC. and *Manglietia* spp. A higher proportion of the Lauraceae and Magnoliaceae than in tropical forests of lower altitudes is another feature of this forest. The richness of Indo-Malesian elements appears to be smaller than in the Doi Inthanon forest, and emergent trees such as *Mastixia euonymoides* are usually absent, although these elements are still major constituents of the flora.

5. *Mastixia euonymoides* Prain

This most dominant species in our plot is not only ecologically important in the forest but also notable from a phytogeographical viewpoint.

The present distribution of the genus *Mastixia* is strictly confined to tropical Asia, showing the typical distribution pattern of Indo-Malesian elements. However, according to Matthew (1977), the genus was a common constituent of the Tertiary mixed mesophytic forests of the Northern Hemisphere, but contracted to its present distribution during the Pleistocene Glacial Epochs, as happened with *Symplocos, Meliosma, Engelhardtia*, and many other genera of the Tertiary mixed mesophytic forest.

Among the present 13 species of *Mastixia*, two species, *M. euonymoides* and *M. octandra* Matthew, were included in the subgenus *Manglesia* (Matthew, 1976). Both have a small distribution area, disjunct with each other, and are possibly ancient and of relict nature. The distribution of *M. euonimoides* is known only from two small areas, around Chiang Mai in northern Thailand and the border area between India and Myanmar.

Conclusion

Reflecting the geographical location of Doi Inthanon, the flora of this forest at species level is a mixture of many elements common to the Himalayas, Malesia and other areas of tropical Asia. The floristic affinity to tropical montane forests in Malesia at genus level is relatively high. In common with montane forests northwards (in southwestern China and the eastern Himalayas), the Lauraceae, Fagaceae and Magnoliaceae dominate, but the Doi Inthanon forest appears to be richer in tropical elements and to show more complex stratification with emergent trees. The dominant species in the plot, *Mastixia euonymoides* Prain, is a rare species of a relict nature, found only in northern Thailand and the border area between Myanmar and India. This article is a preliminary description of the tree flora of our 15-ha forest dynamics plot at Doi Inthanon. Ecological and taxonomic analysis of the plant species diversity of the forest is still in progress and will be presented fully in the future.

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北タイ・ドイインタノン国立公園における熱帯山地林の種組成
—特に熱帯アジアの他地域の山地林との植物地理学的関係について—

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北タイ・ドイインタノン中腹の熱帯山地林に設置した 15 ha の森林動態調査区内の胸高直径 1.0 cm 以上の樹木の毎木調査データに基づき，この森林の種組成を予報的に報告した．調査区内で確認された樹木種は 58 科 106 属 165 種で，そのうち 126 種（全体の 77%）については種まで同定された．種の豊富さについては，科レベルではクスノキ科が 25 種で最大，属レベルではハマビワ属（クスノキ科）が 9 種で最大の値を示した．胸高断面積について，科レベルでは，ブナ科，クスノキ科，ミズキ科がそれぞれ 20.0%，15.1%，11.8% を占めて優占していた．調査区で最も優占していた種はミズキ科の *Mastixia euonymoides* Prain であった．種名の判明した 126 種のうち，74 種 (59%) はヒマラヤと共通，48 種 (38%) はマレーシア地域と共通に分布する種であった．属レベルではマレーシア地域の熱帯山地林とも組成上の共通性が比較的，高かった．中国南部やヒマラヤ東部の山地林と比べると，ブナ科やクスノキ科，モクレン科が優占する点は共通していたが，ドイインタノンの山地林の方が熱帯要素が豊富であった．

Appendix 1. List of voucher specimens and major references used for identification. Voucher specimens are kept in the Herbarium of Natural History Museum and Institute, Chiba (CBM), Japan. DIFDP is an abbreviaiton of our research project (Doi Inthanon Forest Dynamics Plot) and DIFDP Specimen No. is a specimens number of our project. For Fagaceae, the nomenclature follows Govaerts, R. and D. G. Frodin, 1998, World Checklist and Bibliography of Fagales, 407 pp., The Royal Botanic Gardens, Kew, London. For Magnoliaceae, Govaerts, R. and D. G. Frodin, 1996, World Checklist and Bibliography of Magnoliaceae, 72 pp., The Royal Botanic Gardens, Kew, London. Floras are abbreviated as follows in the colum of references; FB, Flora of Bhutan; FBI, Flora of British India; FC, Flora of China; FCLV, Flore du Cambodge, du Laos et du Viêtnam; FM, Flora Malesiana; FRPS, Flora Republicae Popularis Sinicae (in Chinese); FT, Flora of Thailand; FWP, Flora of West Pakistan (Flora of Pakistan); FY, Flora Yunnanica (in Chinese); TFM, Tree Flora of Malaya;

Family	Species	References	Specimen No. CBM-BS No. (DIFDP No.)
Aceraceae	*Acer laurinum* Hassk.	Santisuk in Nat. Hist. Bull. Siam Soc. 46: 94–95. 1998.	177611 (1105)
Alanginiaceae	*Alangium kurzii* Craib	Tardieu-Blot in FCLV 8: 41–43. 1968.	177617 (1146)
Aquifoliaceae	*Ilex longecaudata* Comber var. *longecaudata*	Chen in FRPS 45(2): 220–222. 1999.	177633 (957)
Aquifoliaceae	*Ilex micrococca* Maxim.	Chen in FRPS 45(2): 248–250. 1999.	177639 (1143)
Araliaceae	*Brassaiopsis* cf. *glomerulata* (Blume) Regel	Hoo & Tseng in FRPS 54: 124. 1978.	177646 (1100)
Betulaceae	*Betula alnoides* Buch.-Ham.	Li & Skvortsov in FC 4: 306. 1999.	177660 (342)
Boraginaceae	*Cordia* cf. *cochinchinensis* Gagnep.	Zhu et al. in FC 16: 332–333. 1995.	176436 (1032)
Burseraceae	*Protium serratum* Wall. ex Colebr. & Engl.	Li in FRPS 43(3): 18–20. 1997.	177669 (1168)
Capparaceae	*Capparis* cf. *assamica* Hook. f. & Thoms.	Sun in FRPS 32: 508. 1999.	177671 (1661)
Capparaceae	*Capparis sabiaefolia* Hook. f. & Thoms.	Sun in FRPS 32: 498. 1999.	177672 (66)
Caprifoliaceae	*Viburnum punctatum* Ham ex D. Don	Hsu in FRPS 72: 65–66. 1988.	177480 (1690)
Celastraceae	*Euonymus colonoides* Craib	Craib in Bull. Misc. Inform. Kew 1926: 348. 1926	177687 (1038), 177431 (1189)
Combretaceae	*Combretum puctatum* Blume ssp. *squamosum* (Roxb. ex G. Don) Exell	Hsu in FRPS 53(1): 25. 1984.	177699 (149)
Cornaceae	*Mastixia euonymoides* Prain	Matthew in Blumea 23: 64–65. 1976.	176409 (1130), 176408 (1258)
Daphniphyllaceae	*Daphniphyllum* cf. *glaucescens* Blume ssp. *beddomei* (Craib) Huang	Huang in Taiwania (12): 186–188. 1966.	176421 (1009), 176420 (1132)
Ebenaceae	*Diospyros frutescens* Blume	Phengklai in FT 2(4): 313–315. 1981.	176431 (447)
Ebenaceae	*Diospyros glandulosa* Lace	Phengklai in FT 2(4): 339. 1981.	177468 (1682), 176428 (1182)
Elaeocarpaceae	*Elaeocarpus braceanus* Watt ex C. B. Clarke	Phengklai in FT 2(4): 412–415. 1981.	176439 (1559)
Elaeocarpaceae	*Elaeocarpus lanceifolius* Roxb.	Phengklai in FT 2(4): 422–424. 1981.	176446 (1099), 176443 (846)
Elaeocarpaceae	*Elaeocarpus petiolaris* (Jack.) Wall ex Kurz	Phengklai in FT 2(4): 424–427. 1981.	176434 (1642)
Euphorbiaceae	*Antidesma sootepense* Craib	Li in FRPS 44(1): 62–63. 1994.	176462 (629)
Euphorbiaceae	*Baliospermum micrantum* Müll.Arg.	Chang in FRPS 44(2): 179–181. 1996.	176466 (1663), 176468 (1662)
Euphorbiaceae	*Drypetes indica* (Müll.Arg.) Pax & Hoffm. var. *indica*	Li in FRPS 44(1): 50–51. 1994.	176481 (1382), 176479 (642)
Euphorbiaceae	*Glochidion. zeylanicum* (Gaertn.) A. Juss	Li in FRPS 44(1): 145. 1994.	176487 (1334)
Euphorbiaceae	*Macaranga denticulata* (Blume) Muell.-Arg.	Kiu in FRPS 44(2): 53–55. 1996.	176491 (1116)
Euphorbiaceae	*Mallotus khasianus* Hook. f.	Hooker in FBI 5: 438–439. 1887.	176506 (636), 176504 (637)
Euphorbiaceae	*Ostodes paniculata* Blume	Chang in FRPS 44(2): 157–158. 1996.	177437 (1193)

Appendix 1. (Continued)

Family	Species	References	Specimen No. CBM-BS No. (DIFDP No.)
Fagaceae	*Castanopsis acuminatissima* (Blume) A. DC.	Soepadmo in FM Ser. I 7: 307–309. 1972.	176586 (1271)
Fagaceae	*Castanopsis calathiformis* Kurz	Huang et al. in FC 4: 320. 1999.	176556 (1191)
Fagaceae	*Castanopsis purpurea* Barnett	Barnett in Bull. Misc. Inform. Kew 1938: 105–106. 1938.	176514 (1444)
Fagaceae	*Lithocarpus aggregatus* Barnett subsp. *aggregatus*	Barnett in Bull. Misc. Inform. Kew 1938: 104–105. 1938.	176646 (1558)
Fagaceae	*Lithocarpus echinops* Hjelmq.	Hjelmquist in Dansk Bot. Ark. 23: 491–493. 1968.	176618 (1557)
Fagaceae	*Lithocarpus vestitus* (Hickel & A. Camus) A. Camus	Camus in Chenes 3: 939–940. 1952–1954.	176620 (1114)
Fagaceae	*Quercus brevicalyx* A. Camus	Camus in Chenes 3: 1213. 1952–1954.	176769 (1519), 177470 (1685)
Fagaceae	*Quercus eumorpha* Kurz (Syn.=*Q. lenticellata* Barnett)	*Q. lenticellata* Barnett, Barnett in Bull. Misc. Inform. Kew 1938: 98–99. 1938.	176761 (1034)
Guttiferae	*Calophyllum polyanthum* Wall.	Li in FRPS 50(2): 84–86. 1990.	176781 (1102), 176780 (1010)
Icacinaceae	*Gomphandra tetrandra* (Wall. in Roxb.) Sleumer	Sleumer in FT 2(1): 79–80. 1970.	176794 (1617)
Icacinaceae	*Nothapodytes* cf. *obscura* C. Y. Wu	Wu in FY 1: 170–171. 1977.	177479 (1691)
Icacinaceae	*Pittosporopsis kerrii* Craib	Sleumer in FT 2(1): 84. 1970.	177474 (1696)
Icacinaceae	*Platea latifolia* Blume	Sleumer in FT 2(1): 76–77. 1970.	176798 (289)
Juglandaceae	*Engelhardia spicata* Lesch. ex Blume var. *spicata*	Jacobs in FM Ser. I 6(1): 151–154. 1960.	176802 (653)
Labiatae	*Gomphostemma arbusculum* C. Y. Wu	Li & Hedge in FC 17: 73. 1994.	176806 (19)
Lauraceae	*Beilschmiedia* cf. *pauciflora* H. W. Li	Lee & Wei in FRPS 31: 134. 1984.	177476 (1694)
Lauraceae	*Beilschmiedia glauca* Sin. C. Lee et L. F. Lau var. *glaucoides* H. W. Li	Lee & Wei in FRPS 31: 141–142. 1984.	176857 (1660)
Lauraceae	*Beilschmiedia purpurascens* H. W. Li	Lee & Wei in FRPS 31: 130. 1984.	176855 (1481)
Lauraceae	*Cinnamomum bejolghota* (Ham.) Sweet var. *bejolghota*	Long in FB 1(2): 39. 1984.	176850 (640), 176852 (1666)
Lauraceae	*Cinnamomum* cf. *soegengii* Kosterm.	Kostermans in Reinwardtia 8(1): 67–68. 1970.	176842 (1665)
Lauraceae	*Cryptocarya* cf. *calcicola* H. W. Li	Li & Pai in FRPS 31: 448–450. 1982.	176864 (1045), 176863 (1225)
Lauraceae	*Cryptocarya densiflora* Blume	Li & Pai in FRPS 31: 441–443. 1982.	176867 (1042), 176868 (1007)
Lauraceae	*Lindera metcalfiana* Allen	Li in FRPS 31: 401–403. 1982.	176883 (1015), 176887 (1669)
Lauraceae	*Litsea beusekomii* Kostermans	Kostermans in Nat. Hist. Bull. Siam Soc. 25(3/4): 36–37. 1974.	176930 (357), 176933 (1092)
Lauraceae	*Litsea* cf. *membranifolia* Hook. f.	Hooker in FBI 5: 159. 1886.	176922 (919), 176923 (1112)
Lauraceae	*Litsea cubeba* Pers.	Yang & Huang in FRPS 31: 271–272. 1982.	176953 (1031), 176954 (1671)
Lauraceae	*Litsea lancifolia* Hook. f.	Yang & Huang in FRPS 31: 291. 1982.	176946 (641)
Lauraceae	*Litsea pedunculata* (Diels) Yang & P. H. Huang	Yang & Huang in FRPS 31: 310–311. 1982.	176936 (1296), 176935 (1108)
Lauraceae	*Litsea subcoriacea* Yen C. Yang & P. H. Huang	Yang & Huang in FRPS 31: 315. 1982.	176918 (1106), 176917 (1236)
Lauraceae	*Litsea yunnanensis* Yen C. Yang & P. H. Huang	Yang & Huang in FRPS 31: 317–319. 1982.	176950 (1091), 176948 (1364)
Lauraceae	*Neolitsea zeylanica* (Nees) Merr.	Yang & Huang in FRPS 31: 363–364. 1982.	176880 (1465)
Lauraceae	*Persea duthiei* (King ex Hook. f.) Kosterm.	Kostermans in FWP (118): 7–9. 1978.	176893 (1518), 176892 (1616)
Lauraceae	*Phoebe macrocarpa* C. Y. Wu	Lee & Wei in FRPS 31: 108–109. 1984.	176908 (1628)

Appendix 1. (Continued)

Family	Species	References	Specimen No. CBM-BS No. (DIFDP No.)
Leguminosae	*Archidendron clypearia* (Jack) L. T. Nielsen ssp. *clypearia* var. *clypearia*	Nielsen in FT 4(2): 208–211. 1985.	176813 (1125)
Magnoliaceae	*Manglietia garretii* Craib	Keng in FT 2(3): 252–253. 1975.	176959 (1082)
Magnoliaceae	*Michelia baironii* (Pierre) Finet & Gagnep. (Syn.=*Paramichelia baironii* (Pierre) Hu)	*Paramichelia baironii* (Pierre) Hu, in Keng in FT 2(3): 266–267. 1975.	176962 (1207), 176963 (1206)
Melastomataceae	*Pseudodissochaeta septentrionalis* (W. W. Sm.) Nayar	Renner *et al.* in FT 7(3): 475–476, 2001.	176976 (1237), 176977 (649)
Meliaceae	*Heynea trijuga* Sims	Mabberley *et al.* in FM Ser. I 12(1): 41–44. 1995.	176979 (1639), 176980 (1346)
Meliaceae	*Toona ciliata* M. Roem.	Mabberley *et al.* in FM Ser. I 12(1): 366–370. 1995.	176973 (1101)
Moraceae	*Artocarpus* cf. *lacucha* Ham.	Chang & Cao in FRPS 23(1): 55. 1998.	177009 (54)
Moraceae	*Broussonetia kazinoki* Sieb.	Chang in FRPS 23(1): 26. 1998.	177011 (1119)
Moraceae	*Ficus hirta* Vahl var. *hirta*	Chang *et al.* in FRPS 23(1): 160–164. 1998.	176994 (948)
Myricaceae	*Myrica esculenta* Buch.-Ham.	Larsen in FT 7(2): 268–270. 2000.	176987 (670), 176986 (1086)
Myrsinaceae	*Ardisia attenuata* Wall. ex A. DC.	Larsen & Hu in FT 6(2): 129. 1996.	177016 (104), 177015 (1103)
Myrsinaceae	*Ardisia corymbifera* Mez var. *corymbifera*	Larsen & Hu in FT 6(2): 133–134. 1996.	177023 (1673), 177022 (966)
Myrsinaceae	*Ardisia rubro-glandulosa* Fletcher	Larsen & Hu in FT 6(2): 95. 1996.	177020 (964)
Myrsinaceae	*Ardisia virens* Kurz	Larsen & Hu in FT 6(2): 134–135. 1996.	177025 (15)
Myrsinaceae	*Embelia pulchella* Mez	Larsen & Hu in FT 6(2): 156–157. 1996.	177029 (1674)
Myrsinaceae	*Maesa montana* A. DC.	Larsen & Hu in FT 6(2): 175. 1996.	177048 (467)
Myrsinaceae	*Maesa permollis* Kurz	Larsen & Hu in FT 6(2): 170. 1996.	177043 (1044), 177045 (845)
Myrsinaceae	*Myrsine semiserrata* Wall.	Larsen & Hu in FT 6(2): 164. 1996.	177053 (689), 177054 (692)
Myrsinaceae	*Rapanea yunnaensis* Mez	Larsen & Hu in FT 6(2): 167. 1996.	177039 (1006), 177042 (1089)
Myrtaceae	*Syzygium angkae* (Craib) P. Chantaranothai & J. Parnell ssp. *angkae*	Craib in Bull. Misc. Inform. Kew 1929: 115. 1929., Chantaranothai & Parnell in Kew Bull. 48(3): 592. 1993.	177073 (1029)
Myrtaceae	*Syzygium tetragonum* Wall.	Pai in FY 7: 118. 1997., Long & Rae in FB 2(1): 285. 1991.	177066 (1022)
Nyssaceae	*Nyssa javanica* Wangerin	Phengklai in FT 2(4): 402–404. 1981.	177075 (1036), 177076 (1188)
Olacaceae	*Schoepfia fragrans* Wall.	Sleumer in FM Ser. I 10: 27–29. 1984.	177080 (713)
Oleaceae	*Chionanthus ramiflorus* Roxb.	Green in FT 7(2): 283. 2000.	177089 (1234)
Oleaceae	*Olea* cf. *salicifolia* Wall.	Green in FT 7(2): 274–276. 2000.	177083 (378)
Pittosporaceae	*Pittosporum chatterjeeanum* Gowda	Gowda in J. Arnold Arboretum 32: 318. 1951.	177124 (643)
Podocarpaceae	*Podocarpus neriifolius* D.Don	Phenglai in FT 2(3): 199–200. 1975.	177111 (1133)
Polygalaceae	*Polygala arillata* Ham.	van der Meijden in FM Ser. I 10: 469. 1988.	177115 (1230), 177117 (652)
Rhizophoraceae	*Carallia brachiata* (Lour.) Merr.	Hou in FT 2(1): 13–14. 1970.	177230 (1629)
Rosaceae	*Prunus javanica* (Tejism. & Binn.) Miq.	Vidal in FT 2(1): 69. 1970.	177475 (1695)
Rosaceae	*Prunus phaeosticta* (Hance) Maxim.	Vidal in FT 2(1): 69–70. 1970.	177222 (1048)
Rosaceae	*Prunus wallichii* Steud.	Vidal in FT 2(1): 68–69. 1970.	177216 (1324)
Rosaceae	*Sorbus granulosa* (Bertol.) Rehd. var. *granulosa*	Vidal in FT 2(1): 36–37. 1970.	177210 (100)
Rubiaceae	*Aidia* cf. *yunnanensis* (Hutch.) T. Yamaz.	Chen in FRPS 71(1): 351. 1999.	177154 (1043), 177155 (1016)

Appendix 1. (Continued)

Family	Species	References	Specimen No. CBM-BS No. (DIFDP No.)
Rubiaceae	*Ixora* cf. *kerrii* Craib	Craib in Bull. Misc. Inform. Kew 1914: 128. 1914.	177170 (1008)
Rubiaceae	*Lasianthus hookerii* C. B. Clarke ex Hook. f. var. *hookeri*	Zhu in Acta Phytotax. Sin. 39(2): 131. 2001.	177129 (1675)
Rubiaceae	*Lasianthus inodorus* Bl. (Syn.=*L. tubiferus* Hook. f.)	Zhu in Acta Phytotax. Sin. 39(2): 132. 2001.	177140 (949)
Rubiaceae	*Lasianthus saxorum* Craib	Zhu in Acta Phytotax. Sin. 39(2): 141. 2001.	177138 (718)
Rubiaceae	*Lasianthus sikkimensis* Hook f.	Zhu in Acta Phytotax. Sin. 39(2): 141. 2001.	177134 (229)
Rubiaceae	*Mycetia rivicola* Craib	Craib in Bull. Misc. Inform. Kew 1914: 126–127. 1914.	177193 (178)
Rubiaceae	*Psychotria calocarpa* Kurz	Hooker in FBI 3: 173. 1882.	177178 (103)
Rubiaceae	*Psychotria densa* W. C. Chen	Chen in Acta Phytotax. Sin. 30(5): 484–486. 1992.	177181 (1369), 177180 (16)
Rubiaceae	*Psychotria symplocifolia* Kurz	Hooker in FBI 3: 172. 1882.	177173 (1104)
Rubiaceae	*Tarenna disperma* (Hook. f.) Pit. (Syn.= Webra disperma Hook f.)	*Webra disperma* Hook f. in FBI 3: 102. 1882.	177161 (1024)
Rubiaceae	*Wendrandia scabra* Kurz var. *scabra*	Chen in FRPS 71(1): 212–213. 1999.	177147 (1040)
Rutaceae	*Melicope pteleifolia* (Champ. ex Benth.) T. G. Hartley	Hartley in Allertonia 8: 243–245. 2001.	177241 (1085), 177239 (12)
Rutaceae	*Zanthoxylum rhesta* (Roxb.) DC.	Grierson in FB 2(1): 13. 1991.	177242 (1121), 177244 (1139)
Sapotaceae	*Sarcosperma arboreum* Buch.-Ham. ex C. B. Clarke	Li & Pennington in FC 15: 214. 1996.	177272 (1228), 177274 (1046)
Saxifragaceae	*Dichroa febrifuga* Lour.	Lecompte in FCLV 4: 30–32. 1965.	177260 (195)
Saxifragaceae	*Polyosma integrifolia* Blume	Lecompte in FCLV 4: 45–46. 1965.	177257 (1094), 177255 (623)
Scrophulariaceae	*Cyrtandromoea grandiflora* C. B. Clarke	Yamazaki in FT 5(2): 142. 1990.	177481 (158)
Scrophulariaceae	*Wightia speciosissima* (D. Don) Merr.	Yamazaki in FT 5(2): 155. 1990.	177251 (1443)
Solanaceae	*Lycianthes neesiana* (Wall. ex Nees) D'Arcy & Z. Y. Zhang	Zhang & D'Arcy in FC 17: 327–328. 1994.	177478 (1692)
Staphyleaceae	*Turpinia nepalensis* Wall.	Long in FB 2(1): 129. 1991.	177310 (638)
Sterculiaceae	*Pterospermum* cf. *grandiflorum* Craib.	Craib in Bull. Misc. Inform. Kew 1913: 67. 1913.	177326 (219)
Symplocaceae	*Symplocos henschelii* (Mor.) Benth. ex C. B. Clarke. var. *magnifica* (Fletcher) Noot.	Nooteboom in FT 2(4): 451–452. 1981.	177285 (1090)
Symplocaceae	*Symplocos hookeri* C. B. Clarke	Nooteboom in FT 2(4): 459. 1981.	177283 (109), 177280 (252)
Symplocaceae	*Symplocos macrophylla* Wall. ex DC. ssp. *sulcata* (Kurz) Noot. var. *sulcata*	Nooteboom in FT 2(4): 460–461. 1981.	177293 (1280), 177302 (1011)
Theaceae	*Adinandra integerrima* T. Anderson ex Dyer	Keng in FT 2(2): 151–152. 1972.	177352 (1199)
Theaceae	*Camellia oleifera* Abel var. *confusa* (Craib) Sealy	Keng in FT 2(2): 147–148. 1972.	177365 (706)
Theaceae	*Camellia taliensis* (W. W. Sm.) Melch.	Keng in FT 2(2): 148–149. 1972.	177360 (1020)
Theaceae	*Eurya nitida* Korth. var. *nitida*	Keng in FT 2(2): 156–157. 1972.	177338 (168), 177341 (1233)
Theaceae	*Pyrenaria garrettiana* Craib	Keng in FT 2(2): 150. 1972.	177371 (1634), 177370 (1197)
Thymelaeaceae	*Daphne composita* (L. f.) Gilg	Peterson in FT 6(3): 243–244. 1997.	177391 (644)
Urticaceae	*Debregeasia longifolia* (Burm. f) Wedd.	Li in FY 7: 341–342. 1997.	177407 (656)
Urticaceae	*Oreocnide rubescens* (Blume) Blume ex Miq.	Li in FY 7: 348–350. 1997.	177010 (836)

Appendix 2. Geographic distributions of component species. For each distribution type, refer text. W Himalaya, Pakistan and western Nepal; E Himalaya, eastern Nepal, north-eastern India (Sikkim and Assam), Bhutan, Bangladesh and Sri Lanka; SC China, south-eastern Xizang, Yunnan, southern Sichuan, Guizhou, Guangxi and Hainan; SE China, Guangdong, Hunan, Jiangxi, Fujian and Zhejiang; W Malesia, Peninsular Malaysia, Philippines, Borneo, Sumatra and Jawa; E Malesia, Sulawesi, Moluccas, Lesser Sunda Islands and New Guinea.

Family	Species	Distribution Type	Madagascar	W Himalaya	E Himalaya	Myanmar	Thailand	SC China	SE China	Indochina	W Malesia	E Malesia	Taiwan	Korea & Japan	Australia	Micronesia
Celastraceae	*Euonymus colonoides* Craib	1					○									
Fagaceae	*Castanopsis purpurea* Barnett	1					○									
Fagaceae	*Lithocarpus echinops* Hjelm.	1					○									
Lauraceae	*Litsea beusekomii* Kosterm.	1					○									
Myrsinaceae	*Ardisia rubroglandulosa* Fletcher	1					○									
Rubiaceae	*Ixora* cf. *kerrii* Craib	1					○									
Rubiaceae	*Lasianthus saxorum* Craib	1					○									
Rubiaceae	*Mycetia rivicola* Craib	1					○									
Sterculiaceae	*Pterospermum* cf. *grandiflorum* Craib	1					○									
Symplocaceae	*Symplocos henschelii* (Mor.) Benth ex C. B. Clarke var. *magnifica* (Fletcher) Noot.	1					○									
Aquifoliaceae	*Ilex longecaudata* Comber var. *longecaudata*	2					○	○								
Fagaceae	*Lithocarpus aggregatus* Barnett subsp. *aggregatus*	2					○			○						
Fagaceae	*Lithocarpus vestitus* (Hickel & A. Camus) A. Camus	2					○			○						
Fagaceae	*Quercus brevicalyx* A. Camus	2					○			○						
Fagaceae	*Quercus eumorpha* Kurz	2				○	○									
Icacinaceae	*Nothapodytes* cf. *obscura* C. Y. Wu	2					○	○								
Labiatae	*Gomphostemma arbusculum* C. Y. Wu	2					○	○								
Lauraceae	*Beilschmiedia* cf. *pauciflora* H. W. Li	2					○	○								
Lauraceae	*Beilschmiedia purpurascens* H. W. Li	2					○	○								
Lauraceae	*Cryptocarya* cf. *calcicola* H. W. Li	2					○	○								
Lauraceae	*Litsea pedunculata* (Diels) Yen C. Yang & P. H. Huang	2					○	○								
Lauraceae	*Litsea subcoriacea* Yen C. Yang & P. H. Huang	2					○	○	○							
Pittosporaceae	*Pittosporum chatterjeeanum* Gowda	2				○	○	○								
Rubiaceae	*Aidia* cf. *yunnanensis* (Hutch.) T. Yamaz.	2					○	○								
Rubiaceae	*Psychotria densa* W. C. Chen	2					○	○								
Rubiaceae	*Tarenna disperma* (Hook. f.) Pit.	2				○	○									
Theaceae	*Camellia taliensis* (W. W. Sm.) Melch.	2					○	○								
Cornaceae	*Mastixia euonymoides* Prain	3			○	○	○									
Elaeocarpaceae	*Elaeocarpus braceanus* Watt ex C. B. Clarke	3			○	○	○	○								
Euphorbiaceae	*Baliospermum micrantum* Müll.Arg.	3			○		○	○								

Appendix 2. (Continued)

Family	Species	Distribution Type	Madagascar	W Himalaya	E Himalaya	Myanmar	Thailand	SC China	SE China	Indochina	W Malesia	E Malesia	Taiwan	Korea & Japan	Australia	Micronesia
Euphorbiaceae	*Drypetes indica* (Müll.Arg.) Pax & Hoffm. var. *indica*	3			○	○	○	○	○							
Euphorbiaceae	*Mallotus khasianus* Hook. f.	3			○		○									
Lauraceae	*Litsea* cf. *membranifolia* Hook. f.	3			○		○									
Lauraceae	*Persea duthiei* (King ex Hook. f.) Kosterm.	3		○	○	○	○									
Myrtaceae	*Syzygium tetragonum* Wall.	3			○		○	○	○							
Rubiaceae	*Psychotria symplocifolia* Kurz	3			○	○	○	○								
Rubiaceae	*Wendrandia scabra* Kurz var. *scabra*	3			○	○	○	○								
Sapotaceae	*Sarcosperma arboreum* Buch.-Ham. ex C. B. Clarke	3			○	○	○	○								
Theaceae	*Pyrenaria garrettiana* Craib	3			○		○	○								
Betulaceae	*Betula alnoides* Buch.-Ham.	4			○	○	○	○	○	○						
Burseraceae	*Protium serratum* Wall. ex Colebr & Engl.	4			○	○	○	○		○						
Capparaceae	*Capparis* cf. *assamica* Hk. f. & Thoms.	4			○	○	○	○		○						
Capparaceae	*Capparis sabiaefolia* Hook. f. & Thoms.	4			○	○	○	○		○						
Ebenaceae	*Diospyros glandulosa* Lace	4			○	○	○			○						
Fagaceae	*Castanopsis calathiformis* Kurz	4			○	○	○	○		○						
Guttiferae	*Calophyllum polyanthum* Wall.	4			○	○	○	○		○						
Icacinaceae	*Gomphandra tetrandra* (Wall. in Roxb.) Sleumer	4			○	○	○	○		○						
Lauraceae	*Cinnamomum bejolghota* (Ham.) Sweet var. *bejolghota*	4			○	○	○	○	○	○						
Magnoliaceae	*Michelia baironii* (Pierre) Finet & Gagnep.	4			○	○	○	○		○						
Moraceae	*Artocarpus* cf. *lacucha* Ham.	4			○	○	○	○		○						
Myricaceae	*Myrica esculenta* Buch.-Ham.	4			○		○	○	○	○						
Myrsinaceae	*Maesa montana* A. DC.	4			○	○	○	○	○	○						
Myrsinaceae	*Myrsine semiserrata* Wall.	4			○	○	○	○	○	○						
Rosaceae	*Prunus phaeosticta* (Hance) Maxim.	4			○	○	○	○	○	○			○			
Rosaceae	*Sorbus granulosa* (Bertol.) Rehd. var. *granulosa*	4			○		○	○	○	○						
Rubiaceae	*Lasianthus hookerii* C. B. Clarke. ex Hook. f. var. *hookeri*	4			○	○	○	○		○						
Scrophulariaceae	*Wightia speciosissima* (D. Don) Merr.	4			○	○	○	○		○						
Staphyleaceae	*Turpinia nepalensis* Wall.	4			○		○	○		○						
Symplocaceae	*Symplocos hookeri* C. B. Clarke	4			○	○	○	○		○						
Symplocaceae	*Symplocos macrophylla* Wall. ex DC. ssp. *sulcata* (Kurz) Noot. var. *sulcata*	4			○	○	○	○		○						
Theaceae	*Camellia oleifera* Abel. var. *confusa* (Craib) Sealy	4			○	○	○	○	○	○						
Aquifoliaceae	*Ilex micrococca* Maxim.	5					○	○	○	○			○	○		

Appendix 2. (Continued)

Family	Species	Distribution Type	Madagascar	W Himalaya	E Himalaya	Myanmar	Thailand	SC China	SE China	Indochina	W Malesia	E Malesia	Taiwan	Korea & Japan	Australia	Micronesia
Boraginaceae	*Cordia* cf. *cochinchinensis* Gagnep.	5					○	○		○						
Daphniphyllaceae	*Daphniphyllum* cf. *glaucescens* Blume ssp. *beddomei* (Craib) P. H. Huang	5				○	○			○						
Euphorbiaceae	*Antidesma sootepense* Craib	5				○	○	○		○						
Icacinaceae	*Pittosporopsis* kerrii Craib	5				○	○	○		○						
Lauraceae	*Lindera metcalfiana* Allen	5					○	○	○	○						
Lauraceae	*Litsea yunnanensis* Yen C. Yang et P. H. Huang	5					○	○		○						
Lauraceae	*Phoebe macrocarpa* C. Y. Wu	5					○	○		○						
Magnoliaceae	*Manglietia garretii* Craib	5					○	○		○						
Melastomataceae	*Pseudodissochaeta septentrionals* (W. W. Sm.) Nayar	5				○	○	○	○	○						
Moraceae	*Broussonetia kazinoki* Siebold	5					○	○	○				○	○		
Myrsinaceae	*Ardisia attenuata* Wall. ex A. DC.	5				○	○	○		○						
Myrsinaceae	*Ardisia corymbifera* Mez var. *corymbifera*	5					○	○		○						
Myrsinaceae	*Maesa permollis* Kurz	5				○	○	○		○						
Myrsinaceae	*Rapanea yunnaensis* Mez	5				○	○	○	○	○			○	○		
Myrtaceae	*Syzygium angkae* (Craib) P. Chantaranothai & J. Parnell ssp. *angkae*	5				○	○			○						
Rutaceae	*Melicope pteleifolia* (Champ. ex Benth.) T. G. Hartley	5				○	○	○	○	○			○			
Aceraceae	*Acer laurinum* Hassk.	6			○	○	○	○		○	○	○				
Araliaceae	*Brassaiopsis* cf. *glomerulata* (Blume) Regel.	6			○	○	○	○	○	○	○					
Caprifoliaceae	*Viburnum punctatum* Ham. ex D. Don	6			○	○	○	○	○	○	○					
Combretaceae	*Combretum puctatum* Blume ssp. *squamosum* (Roxb. ex G. Don) Exell	6			○	○	○	○	○	○	○					
Elaeocarpaceae	*Elaeocarpus lanceifolius* Roxb.	6			○	○	○	○		○	○					
Elaeocarpaceae	*Elaeocarpus petiolaris* (Jack.) Wall ex Kurz	6			○	○	○	○	○	○	○					
Euphorbiaceae	*Macaranga denticulata* (Blume) Muell.-Arg.	6			○	○	○	○		○	○					
Euphorbiaceae	*Ostodes paniculata* Blume	6			○	○	○	○	○	○	○					
Fagaceae	*Castanopsis acuminatissima* (Blume) A. DC.	6			○	○	○	○		○	○	○				
Icacinaceae	*Platea latifolia* Blume	6			○	○	○	○	○	○	○	○				
Juglandaceae	*Engelhardia spicata* Lesch. ex Blume var. *spicata*	6			○	○	○	○		○	○	○				
Lauraceae	*Litsea cubeba* Pers.	6			○	○	○	○	○	○	○		○	○		
Lauraceae	*Litsea lancifolia* Hook. f.	6			○	○	○	○	○	○	○					
Leguminosae	*Archidendron clyperaria* (Jack) L. T. Nielsen ssp. *clypearia* var. *clypearia*	6			○	○	○	○	○	○	○	○	○			
Meliaceae	*Heynea trijuga* Sims.	6			○		○	○	○	○	○					
Moraceae	*Ficus hirta* Vahl var. *hirta*	6			○	○	○	○	○	○	○					
Myrsinaceae	*Ardisia virens* Kurz	6			○		○	○	○	○	○		○			
Myrsinaceae	*Embelia pulchella* Mez	6			○	○	○	○		○	○					

Appendix 2. (Continued)

Family	Species	Distribution Type	Madagascar	W Himalaya	E Himalaya	Myanmar	Thailand	SC China	SE China	Indochina	W Malesia	E Malesia	Taiwan	Korea & Japan	Australia	Micronesia
Nyssaceae	*Nyssa javanica* Wangerin	6			○		○	○	○	○	○					
Olacaceae	*Schoepfia fragrans* Wall.	6			○	○	○	○			○					
Oleaceae	*Olea* cf. *salicifolia* Wall.	6			○	○	○	○	○	○	○					
Podocarpaceae	*Podocarpus neriifolius* D.Don	6			○		○	○	○	○	○	○				
Polygalaceae	*Polygala arillata* Ham.	6			○	○	○	○	○	○	○					
Rosaceae	*Prunus wallichii* Steud.	6			○	○	○	○	○	○	○					
Rubiaceae	*Lasianthus inodorus* Blume–	6			○	○	○	○		○	○					
Rubiaceae	*Lasianthus sikkimensis* Hook f.	6			○		○	○	○	○	○					
Rubiaceae	*Psychotria calocarpa* Kurz	6				○	○	○		○	○		○			
Rutaceae	*Zanthoxylum rhesta* (Roxb.) DC.	6			○		○			○	○	○				
Saxifragaceae	*Dichroa febrifuga* Lour.	6			○	○	○	○	○	○	○					
Saxifragaceae	*Polyosma integrifolia* Blume	6			○	○	○	○		○	○					
Solanaceae	*Lycianthes neesiana* (Wall. ex Nees) D'Arcy & Z. Y. Zhang	6			○		○	○	○		○					
Thymelaeaceae	*Daphne composita* (L. f.) Gilg	6			○	○	○	○		○	○					
Urticaceae	*Debregeasia longifolia* (Burm. f) Wedd.	6			○		○	○	○		○					
Urticaceae	*Oreocnide rubescens* (Blume) Blume ex Miq.	6			○	○	○	○		○	○					
Alanginiaceae	*Alangium kurzii* Craib	7				○	○	○	○	○	○					
Ebenaceae	*Diospyros frutescens* Blume	7					○				○					
Lauraceae	*Beilschmiedia glauca* Sin C. Lee & L. F. Lau var. *glaucoides* H. W. Li	7					○	○			○					
Lauraceae	*Cinnamomum* cf. *soegengii* Kosterm.	7					○				○					
Lauraceae	*Cryptocarya densiflora* Blume	7					○	○	○	○	○					
Rosaceae	*Prunus javanica* (Teijsm. & Binn.) Miq.	7				○	○			○	○	○				
Scrophulariaceae	*Cyrtandromoea grandiflora* C. B. Clarke	7				○	○	○			○					
Theaceae	*Adinandra integerrima* T. Anderson ex Dyer	7				○	○	○		○	○					
Euphorbiaceae	*G. zeylanicum* (Gaertn.) A. Juss	8			○		○	○	○	○	○	○	○	○	○	
Lauraceae	*Neolitsea zeylanica* (Nees) Merr.	8			○	○	○	○		○	○				○	
Meliaceae	*Toona ciliata* M. Roem.	8		○	○	○	○	○	○		○	○			○	
Oleaceae	*Chionanthus ramiflorus* Roxb.	8			○	○	○	○	○	○	○	○	○		○	
Rhizophoraceae	*Carallia brachiata* (Lour.) Merr.	8	○		○	○	○	○	○	○	○	○			○	
Theaceae	*Eurya nitida* Korth. var. *nitida*	8			○		○	○	○	○	○					○