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The flora of the Bokor Plateau, southeastern Cambodia: a homage to Pauline Dy Phon

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មូលន័យសង្ខេប

ខ្ពង់រាបបូកគោស្ថិតនៅភាគអាគ្នេយ៍នៃប្រទេសកម្ពុជា ជាទីជម្រករបស់ប្រភេទរុក្ខជាតិកម្រនិងសហគមន៍រុក្ខជាតិសំខាន់ៗនៃព្រៃក្រិន និងព្រៃលូតរហ័ស ព្រមទាំងមានរុក្ខជាតិសម្បូរបែប។ ពង្រីកបន្ថែមលើការងាររបស់ Pauline Dy Phon ដែលមានអាយុកាលជាង ពាក់កណ្តាលសតវត្សកន្លងមកហើយ យើងបានធ្វើបច្ចុប្បន្នភាពលើរុក្ខជាតិមានសរសៃនាំនៅតំបន់ខ្ពង់រាបនេះ។ បញ្ជីកំណត់ត្រារុក្ខជាតិរបស់យើងមាន៣៥៩ប្រភេទ ដែល២២ប្រភេទជាប្រភេទដែលមានតែក្នុងតំបន់បូកគោប៉ុណ្ណោះ។

Abstract

The Bokor Plateau in southeastern Cambodia is home to rare and significant plant communities of stunted forest and heathland, as well as a rich flora. Expanding on the pioneering work of Pauline Dy Phon more than half a century ago, we update the current knowledge of the vascular plant flora of the plateau. Our checklist includes 359 species, with 22 of these endemic to Bokor.

Keywords

Bokor Plateau, Cambodia, stunted forest, heathland, Preah Monivong National Park, endemic species.

Introduction

Bokor National Park (officially known as Preah Monivong National Park) in southeastern Cambodia represents a biodiversity hotspot with a rich plant diversity and a high level of endemism. Within this park the sandstone massif of the Elephant Mountains rises very steeply from a narrow coastal plain along the Gulf of Thailand to an elevation of 1,080 m (Fig. 1). The combination of the steep south-facing slopes of the range and close proximity of the ocean produces unusually wet conditions on the southwestern slopes and upper plateau. Tall species-rich wet forests are present on the lower and middle elevation slopes at Bokor. However, as with tropical montane forests in many other areas of the world, the shallow soils and water-logged depressions at higher elevations on the gently sloping Bokor Plateau exhibit dwarf forests with relatively low sclerophyllous evergreen trees (Dy Phon, 1970; Rundel *et al.*, 2016). A complex interaction of high winds, saturated soils, impeded root respiration, physiological drought, high soil leaching with low nutrient availability, limited rooting volume of shallow soils, reduced solar insolation, and high humidity combine to produce these low forests (Grubb, 1971; 1977; Weaver *et al.*, 1973).

Much of what we know about the plant ecology and flora of Bokor National Park broadly, and the Bokor Plateau more specifically, comes from the remarkable work conducted by Pauline Dy Phon which was carried

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out in the context of her PhD studies at the University of Toulouse in the late 1950s. This detailed study (Dy Phon, 1970) has long formed the basis for understanding the rich plant diversity of global significance in Bokor National Park. Her work has been the stimulus for our studies and for others as well, and we are pleased to dedicate this article to Pauline Dy Phon (see box).

The Bokor Plateau

Despite its seasonal pattern, rainfall on the Bokor Plateau reaches very high levels. Records at 950 m elevation at the southern end of the plateau had a mean annual rainfall of 5,309 mm (Tixier, 1979), while the Val d'Emeraude on the southeast margin of the plateau was reported to receive a mean of 5,384 mm (Dy Phon, 1970). The distribution of this rain peaks sharply in July and August, dropping to a mean of 50 mm or less in January and February at both stations. The Val d'Emeraude experiences rain virtually every day from May through October, but on only 12 days on average in March (Dy Phon, 1970). During the dry season mornings are semi-sunny with scattered clouds moving overhead, while heavier overcast and brief periods of intense showers can occur in the afternoon. Mean monthly temperatures are relatively constant throughout the year, varying only from a low of 19.2°C in July and August to a high of 21.5°C in April (Dy Phon, 1970).

The sandstone substrate of the plateau of the Elephant Mountains weathers into an acidic coarse white sand with a pH of 4.6. Soil profiles of the sphagnum bog as described by Dy Phon (1970) consist of upper sandy A horizons 90 cm in thickness with declining organic matter and increasing saturation with depth. Even in forested areas of the plateau there is often a B horizon at 90–105 cm consisting of an indurated layer of white sand, with yellowish sandstone parent material below this level. As a result there are mosaics present of seasonally water-logged soils.

The wet forests encountered at middle elevations below the plateau on Bokor were termed forest s*ubmontagnardee a fagacées et cibotium* by Dy Phon (1970). These replace the lower wet evergreen forests at elevations of 500–800 or higher. In many ways these are comparable to the hill evergreen forests described in Thailand with a dominant role of Fagaceae and Podocarpaceae in the canopy and the relative absence of Dipterocarpaceae (Rundel *et al.,* 1999). This community changes at about 920 m with the transition from montane wet forest to the Bokor Plateau with its associated edaphic and climatic conditions.

Our study has focused on the gently sloping and weathered Bokor Plateau itself. Here a distinct community of stunted forest (Fig. 2) appears, termed *forêt sempervirente basse de montagne* by Dy Phon (1970). This transition between forest types can be seen near Popokvil Waterfall at about 920 m with mosaics of taller wet forest and lower stunted forest (Fig. 3). The dwarfing of what are commonly tall trees at lower elevations results from a complex interaction of soil depth, elevation, wind exposure, and distance from the coast. This community, which we have called stunted forest, commonly has a matrix that reaches no more than 4 m, while the canopy dominant *Dacrydium elatum* (Roxb.) Wall. ex Hook. with *Dacrycarpus imbricatus* (Blume) de Laub., *Tristaniopsis merguensis* (Griff.) Peter G.Wilson & J.T.Waterh., and *Vaccinium viscifolium* King & Gamble can reach greater heights. The gradient of height for *D. elatum* across the plateau illustrates the effect of environment on stature. Trees near Popkvil Waterfall are 14–16 m in height, but mean height drops to 8–10 m moving across the plateau, and finally only 4–6 m to the south near the developed area (Rundel *et al.,* 2016). Despite changes in commuity structure, tree diversity and density remain relatively unchanged across this gradient (Zhang *et al.,* 2016).

Lianas are common in taller forest stands, including the notable presence of spiny rattans. In addition, there is a moderate diversity of epiphytic and lithophyllic orchids and ferns present. However as soil and wind conditions produce a lower forest canopy, the lianas largely disappear and *Pandanus cupribasalis* H.St.John and *Pinanga sylvestris* (Lour.) Hodel appear in the semi-open understorey.

As soils become shallower and winds increase moving from Popokvil south across the plateau toward the coastal escarpment, the stunted forest is replaced by an irregular cover of sclerophyllous shrubland with a typical height of 1–2 m. Dy Phon (1970) termed this *la lande de myrtacées et vacciniacées*, which we have translated as sclerophyllous heathland. As Dy Phon's name suggests, this community is dominated by species of Myrtaceae and Ericaceae. The former include *Rhodamnia dumetorum* (DC.) Merr. & L.M.Perry, *Rhodomyrtus tomentosa* (Aiton) Hassk., and *Syzygium antisepticum* (Blume) Merr. & L.M.Perry together with *Vaccinium bracteatum* Thunb., *V. viscifolium* King & Gamble, and *Rhododendron moulmainense* Hook. Epiphytes are rare. Open rocky areas that are waterlogged for major portions of the year have a scattered cover of herbaceous perennial such as *Hedyotis rosmarinifolia* (Pit.) Craib and *Polygonum chinense* in a matrix of the graminoids *Carex indica* L., *Fimbrystylis eragrostis* (Nees) Hance, and *Dapsilanthus disjunctus* (Mast.) B.G.Briggs & L.A.S.Johnson.

Localized bog communities (Fig. 4) on the plateau are dominated by a diverse community of low-growing herbaceous perennials 20–30 cm in height. Scattered through this matrix are small islands of shrub establishment where soils have built up to allow better drainage. Four graminoid species provide the major part of the matrix cover (Rundel *et al.,* 2003). These are *Eremochloa eriopoda* C.E.Hubb. (Poaceae), *Eriocaulon ubonense* Lecomte (Eriocaulaceae), and *Dapsilanthus disjunctus* and *Centrolepis cambodiana* Hance (Restionaceae). Small shrub islands scattered across the bog are dominated by single or multiple species reaching to no more than 30–50 cm in height and low mounds 0.5–2.0 m across. Rings of *Sphagnum* spp. are commonly present around the edges of these shrub islands at the edge of the canopy. Tixier (1979) identified these as *S. beccarii* Hampe. and *S. cuspidatum* Ehr. ex Hoffm. Low shrubs forming these islands include *Hedyotis rosmarinifolia* (Rubiaceae), *Ploiarium alternifolium* (Vahl) Melch. (Bonnetiaceae), *Calophyllum calaba* L. var. *cuneatum* (Symington ex M.R.Henderson & Wyatt-Smith) P.F.Stevens (Calophyllaceae), *Ilex wallichii* Hook.f. (Aquifoliaceae), *Syzygium antisepticum* (Myrtaceae), and *Hygrophila ringens* (L.) R.Br. ex Spreng. (Acanthaceae). Species of *Cladonia* and other macrolichens and microbial crusts of cyanobacteria cementing areas of open soil are also present.

History of Bokor Development

The decision by the French colonial government to establish a tourist resort in the uplands of the Elephant Mountains in southeastern Cambodia was made in 1917. The

Pauline Dy Phon, 1933–2010

Pauline Dy Phon made major contributions to our understanding of Cambodian plant ecology, systematics and economic botany, but the significance of her work has not been broadly or appropriately recognized. Although a plant taxonomist and biogeographer by training, her career demonstrated broad interests beyond these fields to include pioneering work on the economic and medicinal uses of Cambodian plants and their cultural significance.

Pauline was born in Cambodia in 1933 to a successful Catholic family. The nation gained independence from France as a constitutional monarchy in 1953, at a time of uncertain political future for the former French colony. With strong family support, Pauline was encouraged to follow her interests and left the country to study in France, obtaining her bachelor's degree in 1959 at the Faculty of Natural Sciences in Paris. She returned to Cambodia to accept a high school teaching position at the Lycée Sisowath in Phnom Penh.

Ambitious though to expand her background in botany, she traveled again to France for graduate work. She obtained her doctorate at the University of Toulouse in 1969, working with Jules Émile Vidal, returning to teach at the Faculty of Sciences in Phnom Penh. It was under her graduate programme that she completed her remarkable work on the vegetation of southeastern Cambodia, which was published in 1970. It was in this era that she also wrote *Guide botanique de la ville de Phnom Penh* (1972) with M.A. Martin, a work republished in 2009. She was recognized by her peers at this time with an appointment by the Cambodian government as chair of the National Commission on Science and Culture.

Pauline's teaching and research career in Phnom Penh was sharply interrupted by the takeover of the country by the Khmer Rouge in April 1975. There followed four difficult years of genocidal government policies that virtually emptied the city of Phnom Penh. Her only written account of the Khmer Rouge period, published in 1982, was a study of "plants in the Khmer diet in normal times and in times of famine".

The Vietnamese invasion in 1979 forced out the Khmer Rouge government but there followed a challenging period of Vietnamese occupation. It was at this time that Pauline sought refuge in France, accepting a position at the Laboratory of Botany at the Natural History Museum in Paris in 1980. This was the beginning of two decades of work in Paris where her research contributed significantly to identifying and classifying the poorly known flora of Cambodia and other countries in Indochina. It was at this time that she completed and published her classic trilingual *Dictionary of Plants Used in Cambodia* (Édition Olympic, Phnom-Penh, 915 pp.).

After the Khmer Rouge period, Pauline returned for the first time to Cambodia in 1994. She died at her home in Paris on 21 May, 2010.

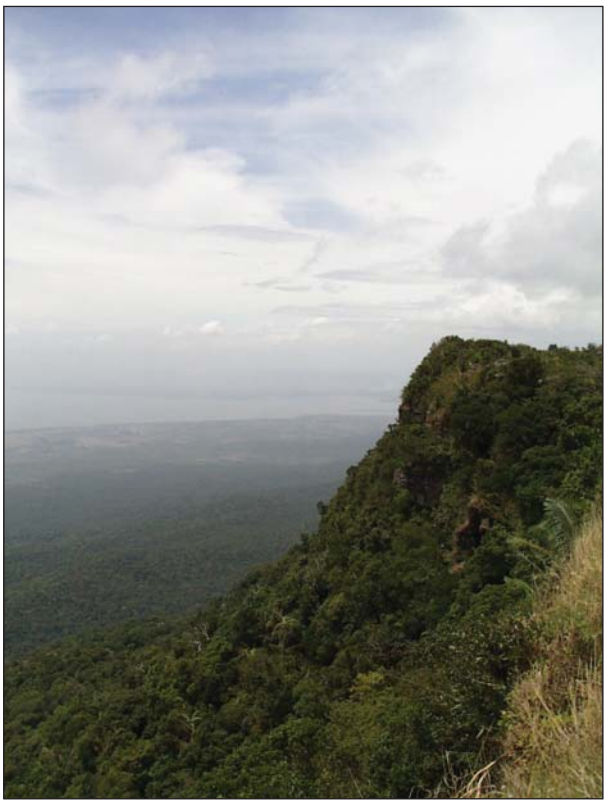

Fig. 1 South-facing escarpment of the Bokor Plateau looking out to the Gulf of Thailand with Phu Quoc Island (Vietnam) in the distance, March 2001 (© Rasoul Sharifi).

Fig. 3 Transition area near Popokvil Waterfall from montane wet evergreen forest to stunted forest on the Bokor Plateau with Dr Kansri Boonpragob of Ramkhamhaeng University, Bangkok, March 2001 (© Rasoul Sharifi).

Fig. 2 Stunted forest of the Bokor Plateau with emergent trees of *Dacrydium elatum,* March 2001 (© Philip Rundel).

Fig. 4 Sphagnum bog and wetland in areas of poor drainage on the Bokor Plateau, March 2001 (© Rasoul Sharifi).

Bokor Plateau was selected, largely for the French elite, for a variety of reasons including its proximity to coastal cities, the cooler upland climate above 1,000 m elevation, the spectacular panorama of the Gulf of Thailand and Phu Quoc Island from the plateau, and the presence of the picturesque Popokvil Waterfall.

A steep, winding road to the plateau was completed in 1921, and the construction of buildings on the plateau began the following year. These included a Catholic church (1922), a Buddhist temple (1924), and finally the luxurious Bokor Hotel Palace at the edge of the escarpment in 1925. The opening of the hotel was associated with the development of associated infrastructure to supply water and electricity and a school and hospital, altogether covering an area of about 5 km^2 (Kowlalcyzk, 2009). The tourist resort was short-lived, however, as the casino was closed in 1940 with the Japanese occupation of Indochina. The end of World War II brought little change to Bokor as an extended war of liberation began throughout the region. Vandalism and gang activity had taken over during the war when some of the buildings were utilized as a military hospital and sanitarium for wounded soldiers.

Two decades passed before an independent Cambodia renovated the hotel and casino in 1959, with Bokor quickly becoming the leading tourist attraction in the country. This golden era for the resort lasted only until 1972 when regional wars made its continued operation untenable. With the coming to power of the Khmer Rouge in 1975, all tourism ceased and Bokor was essentially abandoned. The resort facilities were heavily damaged in 1979 during fighting between Khmer Rouge soldiers and the advancing Vietnamese army who captured the area in 1982.

With the establishment of Bokor National Park in 1993, Cambodian forest rangers established a presence in the park and a small trickle of tourism returned and grew slowly. As political stability returned to Cambodia, there was renewed interest in developing the Bokor Plateau again. In January 2008, the Sokimex Group, a large corporate entity, announced that they had obtained a 99-year lease on 5 km^2 of the plateau for an international tourist development. A new access road up the mountain was soon completed and the large Thansur Bokor Highland Resort and casino constructed with 418 rooms. These developments greatly increased the ease of access and scientific work at Bokor, with increased visits by botanical collectors. In these early stages of resort development, planning is ongoing for extensive expanded facilities including golf courses, individual villas, and agricultural operations, with a proposed total expenditure of US$1 billion (see http://www.sokimex.com/our-business/casino/thansur-bokor-highland-resort).

Conservation

Despite a diverse and ecologically significant flora existing on the Bokor Plateau, conservation needs have not been given serious attention under strong pressures for development. Despite the massive scope of the project, forest and animal protection groups were quiet about the development's potential impact before its opening (Phnom Penh Post, 2012). The scale of ongoing construction can be readily seen in comparing Google Earth images of the plateau before and under current development. Much of the area between the new Thansur Bokor Highland Resort and Popokvil Waterfall has been graded into a network of access roads for housing and infrastructure development. These projects have already impacted the natural communities on the plateau, leading to a strong need to incorporate conservation planning and education into the development process.

The Bokor Plateau includes scattered small sphagnum bogs among its ecological communities, a rare habitat in mainland Southeast Asia (Rundel *et al.,* 2003). The plateau is also home to at least 22 endemic plant species known only from Bokor National Park: *Schefflera cambodiana* Yahara & Tagane, *Argostemma fasciculata* Sridith & Larsen, *Impatiens bokorensis* S.H.Cho & B.Y.Kim, *Garcinia bokorensis* H.Toyama & Yahara, *Diospyros elephasii* Lecomte, *Elaeocarpus bokorensis* Tagane, *Croton phourinii* H.Toyama & Tagane, *Lithocarpus eriobotryifolius* Yahara, *Gentiana ting-nung-hoae* Halda, *Cinnamomum bokorense* Tagane & Yahara, *Lindera bokorensis* Yahara & Tagane, *Machilus bokorensis* Yahara & Tagane, *Neolitsea bokorensis* Yahara & Tagane, *Memecylon bokorense* Tagane, *Sonerila bokorense* S.H.Cho and Y.D.Kim, *Syzygium bokorense* W.K.Soh & J.Parn., *Nepenthes bokorensis* Mey, *Cleyera bokorensis* Nagam. & Tagane, *Phyllanthus bokorensis* Tagane, *Helicia elephanti* Sleumer, *Wikstroemia bokorensis* E.Oguri & Tagane, and *Globba bokorensis* Nob.Tanaka & Tagane.

The Bokor Plateau and its associated development offers significant educational opportunities for Cambodian students at all levels to better appreciate the conservation and sustainability of biodiversity of the country. We hope that there will be broad interest in expanding existing programmes and developing new opportunities for environmental education at Bokor.

The Checklist

Our checklist includes taxa mentioned by Dy Phon (1970) as present on the plateau, our own collections, Sridith &

Larsen (2004), Averyanov *et al.* (2013, 2016), Nuraliev *et al.* (2015), Cho *et al.* (2015, 2017), Schuitemen *et al.* (2016), and reports by Tagane *et al.* (2017) for taxa occurring at or above 920 m. This is the elevation of Popokvil Waterfall. Excluded are non-native plant taxa previously or currently used for landscaping around the developed areas on the plateau. Also excluded are several collections present in the Muséum National d'Histoire Naturelle in Paris for species that are not otherwise accounted for in the collections cited below or in the works of Dy Phon (1970) and Tagane (2017) and for which no altitude data are given. Although some are clearly collections from the plateau area and already accounted for in the list below, many are just as equally clearly taxa of lower altitudes. Although it is possible that the collections include taxa of higher elevations, better data are needed to justify their inclusion in a list accounting only for plants growing above 920 m. Our checklist is comprised of 359 species with 29 ferns and lycophytes, 4 gymnosperms, and 326 angiosperms. The largest family in this checklist is the Rubiaceae with 30 species, followed by the Orchidaceae (28 species), Lauraceae (20 species), and Myrtaceae (13 species). For this flora, 22 species are believed to be endemic to Bokor, as indicated in the text below, highlighting the biodiversity significance of the Bokor Plateau. We hope that our article will serve to stimulate new research that can add to or correct this checklist.

The inclusion of taxa within families follows the Pteridophyte Phylogeny Group (PPG I, 2016) for ferns and lycophytes and the Angiosperm Phylogeny Group (APG IV, 2016) for angiosperms. For ferns and lycophytes, the generic delimitations also follow PPG I (2016), except in *Cyathea* pending clarification of the current placement of the Southeast Asian taxa. For angiosperms, the generic delimitation follows the recent literature for each group of plants most of which is summarised by Stevens (2017). If the spelling or authorship of a taxon name was given incorrectly by an earlier author, we correct it here without comment. What we term stunted forest in the list below is equivalent to what Dy Phon termed *forêt sempervirente basse de montagne*. We have translated her *lande a myrtacées et á vacciniacées* as heathland.

Our work is the outcome of field excursions in 1999 and 2001. The cited Middleton and Monyrak specimens are deposited in the herbarium of the Arnold Arboretum at Harvard University Herbaria (A) and in the Herbarium of the Ministry of the Environment in Phnom Penh. Duplicates of many collections can also be found in the herbarium of the Muséum National d'Histoire Naturelle in Paris (P), which also houses some of the original collections by Dy Phon. Shuichiro Tagane from Kyushu University in Japan and his research group conducted extensive surveys of the flora of the southern slope of Bokor National Park in a series of collecting trips from December 2011 to December 2013. This work, which covered the gradient from the coast to the plateau area, recorded 747 species in 105 families including 24 new species (Tagane *et al.*, 2017). The first set of their collections is deposited in the Kyushu University herbarium in Fukuoka (FU) with a second set in the herbarium of the Forest Administration of Cambodia. Partial sets of collections were distributed to the Forest Herbarium Bangkok (BKF), the Kyoto University Museum (KYO), Royal Botanic Gardens, Kew (K), Naturalis Biodiversity Center (L) and Muséum National d'Histoire Naturelle (P). More recently there have been large collections made by Nguyen Van Du and by Su Kung Wu, with records in TROPICOS database.

LYCOPHYTES

Lycopodiaceae

Huperzia serrata (Thunb. ex Murray) Trevis. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970) as *Lycopodium serratum* Thunb. ex Murray.

Palhinhaea cernua (L.) Vasc. & Franco — Herbaceous perennial in stunted forest and open wetlands. Included by Dy Phon (1970) and Rundel *et al.* (2003) as *Lycopodium cernuum* L.

Phlegmariurus squarrosus (G.Forst.) Á.Löve & D.Löve. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970) as *Lycopodium squarrosum* G.Forst.

Selaginellaceae

Selaginella sp. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

FERNS

Aspleniaceae

Asplenium nidus L. — Uncommon epiphyte in stunted forest. Noted in our work but not collected.

Cyatheaceae

Cyathea gigantea (Wall. ex Hook.) Holttum — Tree fern in understorey of stunted forest. Reported as rare by Dy Phon (1970) under the misapplied name *Cyathea glabra* (Blume) Copel.

Cyathea podophylla (Hook.) Copel. — Tree fern in understorey of stunted forest. Reported by Dy Phon (1970).

Davalliaceae

Davallia repens (L.f.) Kuhn — Lithophytic fern on rocks in exposed area beside track on way to Popokvil Waterfall, Middleton and Monyrak 652. Also reported by Dy Phon (1970) as *Humata repens* (L.f.) Diels.

Davallia solida (G.Forst.) Sw. — Epiphytic fern in stunted forest. Reported by Dy Phon (1970).

Dennstaedtiaceae

Pteridium aquilinum (L.) Kuhn — Terrestrial fern widespread in open grassy areas across the plateau. Noted as common in our work and also noted by Dy Phon (1970)

Pteridium esculentum (G.Forst.) Cockayne — Terrestrial fern at margin of stunted forest. Reported by Dy Phon (1970).

Dicksoniaceae

Cibotium barometz (L.) J.Sm. — Tree fern in understorey of stunted forest. Reported by Dy Phon (1970).

Gleicheniaceae

Dicranopteris linearis (Burm.f.) Underw. — Trailing or scrambling fern common along stunted forest margin. Observed but not collected by us and reported by Dy Phon (1970).

Diplopterygium norrisii (Mett. ex Kuhn) Nakai — Climbing fern at margin of stunted forest. Reported by Dy Phon (1970) as *Gleichenia norrisii* Mett.

Lindsaeaceae

Lindsaea ensifolia Sw. — Terrestrial fern in stunted forest. Reported by Dy Phon (1970) as *Schizoloma ensifolium* (Sw.) J.Sm.

Lygodiaceae

Lygodium flexuosum (L.) Sw. — Herbaceous climbing fern. Reported by Dy Phon (1970) from heathland areas.

Nephrolepidaceae

Nephrolepis brownii (Desv.) Hovenkamp & Miyam. — Terrestrial fern on sandy soil in scrubland near top of plateau, Middleton and Monyrak 600.

Nephrolepis hirsutula (G.Forst.) C.Presl — Epiphytic fern in stunted forest. Reported by Dy Phon (1970).

Oleandraceae

Oleandra musifolia (Blume) C.Presl — Large terrestrial fern in understorey of stunted forest. Reported by Dy Phon (1970).

Oleandra neriiformis Cav. — Terrestrial fern in stunted forest on sandy soil beside stream on way from road to Popokvil Waterfall at 934 m, Middleton and Monyrak 617. Also reported by Dy Phon (1970).

Polypodiaceae

Aglaomorpha coronans (Wall. ex Mett.) Copel. — Epiphytic or terrestrial fern in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 583.

Aglaomorpha rigidula (Sw.) Hovenkamp & S.Linds. — Terrestrial or epiphytic fern in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 608.

Microsorum scolopendria (Burm.f.) Copel. — Epiphytic or lithophytic fern in areas of stunted forest. Reported by Dy Phon (1970) as *Phymatodes scolopendria* (Burm.f.) Ching.

Oreogrammitis dorsipila (Christ) Parris — Lithophytic fern on shaded rocks beside Popokvil Waterfall at 920 m, Middleton and Monyrak 618.

Pyrrosia lingua (Thunb.) Farw. var. *heteractis* (Mett. ex Kuhn) Hovenkamp — Terrestrial fern in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 582. Reported by Dy Phon (1970) as *Pyrrosia eberhardtii* (Christ) Ching. Although terrestrial on the Bokor plateau this species is usually epiphytic.

Selliguea triloba (Houtt.) M.G.Price — Epiphytic or lithophytic fern in areas of stunted forest. Reported by Dy Phon (1970) as *Phymatodes triphylla* (Jacq.) C.Chr. & Tardieu.

Pteridaceae

Pityrogramma calomelanos (L.) Link — Delicate lithophytic fern. Sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 584.

Taenitis blechnoides (Willd.) Sw. — Terrestrial fern in stunted forest. Reported by Dy Phon (1970).

Thelypteridaceae

Cyclosorus interruptus (Willd.) H.Ito — Short erect fern on mossy rock in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 586.

GYMNOSPERMS

Gnetaceae

Gnetum latifolium Blume — Woody climber, occasional at higher elevations around 1,014 m (Tagane *et al.,* 2017).

Podocarpaceae

Dacrycarpus imbricatus (Blume) de Laub. — Tree, common in moist evergreen forest on the plateau. Noted in our work and by Dy Phon (1970) and Tagane *et al.* (2017).

Dacrydium elatum Wall. ex Hook. — Dominant canopy tree over much of the stunted forest on the plateau. Noted by Dy Phon (1970) and Tagane *et al.* (2017). Discussed in Rundel *et al.* (2016) and Tagane *et al.* (2017)

Podocarpus pilgeri Foxw. — Sclerophyllous shrub to small tree in stunted forest among rocks on sandy soil near field

station, at the top of the plateau at 1,042 m, Middleton and Monyrak 613.

ANGIOSPERMS

Acanthaceae

Hygrophila ringens (L.) R.Br. ex Spreng. — Small shrub to tiny herb in seasonally inundated vegetation on sandy soil beside track near Popokvil Waterfall and near field station at 936—1,059 m, Middleton and Monyrak 638, 674. Also listed by Rundel *et al.* (2003) as *Hygrophila angustifolia* R.Br.

Justicia ventricosa Wall. ex Hook.f. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Phlogacanthus geoffrayi Benoist — Shrub at margin of moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Strobilanthes aff. *lilacina* C.B.Clarke — Woody subshrub in heathland and stunted forest areas. Reported by Dy Phon (1970).

Thunbergia grandiflora Roxb. — Open ground beside path to Popokvil Waterfall, scrambling over shrub at 1,034 m, Middleton and Monyrak 626.

Adoxaceae

Viburnum sambucinum Reinw. ex Blume — Small tree in scrubby vegetation and stunted forest on sandy soil near summit on roadside towards research centre at 936 m, Middleton and Monyrak 634. Also reported as common by Tagane *et al.* (2017).

Altingiaceae

Liquidambar siamensis (Craib) Ickert-Bond & J.Wen — Tree in stunted forest. Reported by Tagane et al. (2017). Reported as *Altingia siamensis* Craib by Dy Phon (1970) and treated as a synonym of *Altingia excelsa* Noronha (= *Liquidambar excelsa* (Noronha) Oken) in the *Flora of Thailand*.

Anacardiaceae

Toxicodendron succedaneum (L.) Kuntze — Small tree, common in moist evergreen forest on the plateau (Tagane *et al.*, 2017).

Annonaceae

Uvaria hamiltonii Hook.f. & Thomson — Woody climber, occasional on the plateau (Tagane *et al.*, 2017).

Apiaceae

Centella asiatica (L.) Urb. — Herbaceous creeper. Reported by Dy Phon (1970) from heathland areas.

Apocynaceae

Alyxia reinwardtii Blume — Woody climber, occasional in moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Chilocarpus denudatus Blume — Woody climber, common in moist evergreen forest at higher elevations around 941 m (Tagane *et al.*, 2017).

Hoya multiflora Blume — Epiphytic or lithophytic herb scattered at higher elevations around 925 m (Tagane *et al.*, 2017).

Tabernaemontana bufalina Lour. — Small shrub, occasional in evergreen forest at higher elevations around 1,014 m (Tagane *et al.*, 2017).

Tabernaemontana pauciflora Blume — Small shrub, occasional in evergreen stunted forest at higher elevations around 1,014 m (Tagane *et al.*, 2017).

Tylophora ovata (Lindl.) Hook. ex Steud. — Climber in moist evergreen forest on the upper elevation of the plateau at 1,043 m (Tagane *et al.*, 2017).

Urceola micrantha (Wall. ex G.Don) Mabb. — Woody climber, common in evergreen forests, around 1,014–1,043 m (Tagane *et al.*, 2017).

Aquifoliaceae

Ilex annamensis Tardieu — Shrub in understorey of stunted forest. Reported by Dy Phon (1970).

Ilex cymosa Blume — Tree, common in evergreen forest at higher elevations at 970 m (Tagane *et al.*, 2017).

Ilex excavata Pierre — Tree, fairly common in moist evergreen forest on the top of the plateau at 970–1,043 m (Tagane *et al.*, 2017).

Ilex triflora Blume — Small tree, occasional in moist evergreen forest, common along streamside at 960–1,014 m (Tagane *et al.*, 2017)

Ilex viridis Champ. ex Benth. — Subshrub in heathland areas. Reported by Dy Phon (1970) as *Ilex triflora* Blume var. *viridis* (Champ. ex Benth.) Loes.

Ilex wallichii Hook.f. — Shrub in dry sandy soil on open roadside beside inundated area on track towards Popokvil Waterfall at 936 m, Middleton and Monyrak 627. Also reported by Tagane *et al.* (2017) as a shrub to a tree and locally common in moist evergreen forest and open bog on the plateau at 1,005–1,043 m.

N.B. *Ilex* is a genus that deserves more study at Bokor. In addition to the species above, Tagane *et al.* (2017) report two additional unnamed taxa.

Araceae

Pothos chinensis (Raf.) Merr. — Herbaceous climber in stunted forest. Reported by Dy Phon (1970) as *Pothos cathcartii* Schott.

Scindapsus hederaceus Miq. — Herbaceous climber in stunted forest. Reported by Dy Phon (1970) as *Scindapsus polanei* Gagnep.

Araliaceae

Dendropanax lancifolius (Ridl.) Ridl. — Small tree, occasional in moist evergreen forests on the plateau at 935–1,043 m (Tagane *et al.*, 2017).

Dendropanax maingayi King — Shrub to small tree, common in dense evergreen forest at higher elevations at 962–1,014 m (Tagane *et al.*, 2017).

Polyscias diversifolia (Blume) Lowry & G.M.Plunkett — Small tree, common in moist evergreen forest on the plateau at 970–1,014 m (Tagane *et al.*, 2017).

Schefflera cambodiana Yahara & Tagane — Tree, occasional in moist evergreen forest at higher elevations, especially common by the stream below Popokvil Waterfall at 970 m (Tagane *et al.*, 2017). Endemic to Bokor.

Schefflera pueckleri (K.Koch) Frodin — Tree in stunted forest. Reported as *Tupidanthus calyptratus* Hook. & Thomson by Dy Phon (1970).

Schefflera schizophylla (Hance) Frodin — Tree in stunted forest on sandy soil beside track on way to Popokvil Waterfall at 1,000 m, Middleton and Monyrak 651. Reported by Dy Phon (1970) as *Schefflera incisa* R.Vig.

Schefflera subintegra (Craib) C.B.Shang — Tree in thin soil on rocky ground beside Popokvil Waterfall at 920 m, Middleton and Monyrak 620. Also reported by Tagane *et al.* (2017) from moist evergreen forest at 1,014 m.

Arecaceae

Areca triandra Roxb. ex Buch.-Ham. — Erect palm, occasional in higher elevation (Tagane *et al.*, 2017).

Calamus bousigonii Becc. — Climbing palm in stunted forest. Reported by Dy Phon (1970). Also reported by Tagane *et al.* (2017) as locally common on the plateau at 1,014 m, as well as lower elevations.

Calamus palustris Griff. — Climbing palm common at middle to high elevations (Tagane *et al.*, 2017).

Calamus rudentum Lour. — Spiny climbing palm in stunted forest. Reported by Dy Phon (1970).

Daemonorops jenkinsiana (Griff.) Mart. — Climbing palm in stunted forest. Reported by Dy Phon (1970) as *Daemonorops pierreana* Becc. Also reported by Tagane *et al.* (2017) as occasional in evergreen forest and damp sites in middle and higher elevations, to 928 m.

Pinanga sylvestris (Lour.) Hodel — Erect palm, growing in open areas of the understorey in stunted evergreen forest, often abundant with *Pandanus cupribasalis* H.St. John. Reported by Dy Phon (1970) as *Pinanga cochinchensis* Blume. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest at higher elevations, around 935–1,043 m.

Plectocomia elongata Mart. ex Blume — Stout, climbing palm, somewhat common at higher elevations, around 1,014 m (Tagane *et al.*, 2017).

Plectocomia pierreana Becc. Climbing palm in stunted forest. Reported by Dy Phon (1970) as *Plectocomia cambodiana* Gagnep. ex Humbert. Also reported by Tagane *et al.* (2017) as somewhat common at higher elevations, around 930–1,014 m.

Asphodelaceae

Dianella ensifolia (L.) DC. — Herbaceous perennial in stunted forest understorey. Reported by Dy Phon (1970).

Asparagaceae

Dracaena elliptica Thunb. & Dalm. — Shrub, common in moist evergreen forest on the plateau, and also found in middle elevation. Reported by Dy Phon (1970) and Tagane *et al.* (2017) as *Dracaena gracilis* (Baker) Hook.f., an illegitimate name.

Dracaena reflexa Lam. var. *angustifolia* Baker — Trailing shrub, reported by Dy Phon (1970) from the understorey of stunted evergreen forest.

Chlorophytum orchidastrum Lindl. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Cordyline fruticosa (L.) A.Chev. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Asteraceae

Ageratina adenophora (Spreng.) R.M.King & H.Rob. — Herbaceous perennial on roadsides in heathland area. Reported by Dy Phon (1970) as *Eupatorium adenophora*. Naturalized non-native.

Camchaya kampotensis Gagnep. — Herbaceous perennial in wetland and stunted forest areas. Reported by Dy Phon (1970).

Gynura divaricata (L.) DC. — Herbaceous perennial in heathland area. Reported by Dy Phon (1970) as *Gynura auriculata*.

Elephantopus scaber L. — Herbaceous perennial in heathland area. Reported by Dy Phon (1970)).

Spilanthes iabadicensis A.H.Moore — Herbaceous perennial in heathland area. Reported by Dy Phon (1970) as equal to *S. acmella* (L.) L. *Spilanthes iabadicensis* is placed in synonymy of *Acmella uliginosa* (Sw.) Cass. in the *Flora of Thailand*.

Balanophoraceae

Balanophora fungosa J.R.Forst. & G.Forst. subsp. *indica* (Arn.) B.Hansen. — Herbaceous root parasite in stunted forest. Reported by Dy Phon (1970) as *Balanophora gracilis* Tiegh. and *B. sphaerica* (Tiegh.) Lecomte.

Balsaminaceae

Impatiens angustisepala Tardieu — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Impatiens bokorensis S.H.Cho & B.Y.Kim — Herbaceous perennial known only from the type locality on the Bokor plateau at 1,050 m (Cho *et al.*, 2017). Endemic to Bokor.

Impatiens muelleri Tardieu — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970). The type material of this species from Bokor has been variously labelled with other names in the genus but we continue to recognize it pending a definitive revision of the species.

Impatiens velaxata Hook.f. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

N.B. The genus *Impatiens* is in need of revision for the region.

Bonnetiaceae

Ploiarium alternifolium (Vahl) Melch. — Shrub in seasonally inundated area on sandy soil near top of plateau at 944 m, Middleton and Monyrak 591. Also reported by Tagane *et al.* (2017) as common in open sunny bogs at 926 m. Listed by Rundel *et al.* (2003).

Burmanniaceae

Burmannia disticha L. — Herb in seasonally inundated area on sandy soil near top of plateau at 944 m, Middleton and Monyrak 590. Also listed by Rundel *et al.* (2003).

Calophyllaceae

Calophyllum calaba L. var. *cuneatum* (Symington ex M.R.Hend. & Wyatt-Sm.) P.F.Stevens — Shrub in sclerophyllous stunted forest on rocky sandy soil near field station, near top of plateau at 1,042 m, Middleton and Monyrak 656. Also reported by Tagane *et al.* (2017) as a shrub or tree, common in open sunny bog on the plateau and included by Rundel *et al.* (2003). Dy Phon (1970) reports this as *Calophyllum saigonense* Pierre var. *nanum* Gagnep.

Calophyllum dryobalanoides Pierre — Shrub or tree, rare in moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Calophyllum tetrapterum Miq. — Shrub or tree, common in evergreen forest at higher elevations at 933 m (Tagane *et al.*, 2017).

Cannabaceae

Gironniera subaequalis Planch. — Small tree in thin soil on rocky ground beside Popokvil Waterfall at 920 m, Middleton and Monyrak 621.

Caprifoliaceae

Lonicera cambodiana Pierre ex P.Danguy — Climber, locally common in moist evergreen forest and its margins on the plateau at 1,011–1,043 m (Tagane *et al.*, 2017).

Celastraceae

Euonymus indicus B.Heyne ex Wall. — Shrub on sandy soil in scrubland near the top of the plateau at 1,056 m, Middleton and Monyrak 598. Reported by Tagane *et al.* (2017) as *Euonymus javanicus* Blume var. *talungensis* Pierre and said to be common in moist evergreen forest on the plateau at 1,014 m.

Microtropis discolor (Wall.) Wall. ex Meisn. — Small tree, occasional in evergreen forest, often found in humid sites near streams at 1,014 m (Tagane *et al.*, 2017).

Clusiaceae

Garcinia bokorensis H.Toyama & Yahara — Tree, common in moist evergreen forest on and near the top of the plateau at 935–1,041 m (Tagane *et al.*, 2017). Endemic to Bokor.

Garcinia celebica L. — Tree, occasionally at middle elevations but reaching 928 m (Tagane *et al.*, 2017)

Garcinia hanburyi Hook.f. — Tree in forest from the foot to the top of Mt Bokor. Reported by Dy Phon (1970) and Tagane *et al.* (2017).

Garcinia merguensis Wight — Tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 644, 646. Tagane *et al.* (2017) report that it is widely found from the foot to the top in Mt Bokor.

N.B. The genus *Garcinia* would be appropriate for more detailed study as Tagane *et al.* (2017) list two unidentified species, one from the plateau.

Convolvulaceae

Argyreia longipes (Gagnep.) Traiperm & Staples — Climber, common in moist evergreen forest at higher elevations around 1,014 m (Tagane *et al.*, 2017).

Argyreia scortechinii (Prain) Prain ex Hoogland — Climber in dwarf forest on sandy soil beside track on way to Popokvil Waterfall at 1,000 m, Middleton and Monyrak 647.

Cyperaceae

Carex indica L. — Clump forming sedge in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 581. Reported by Dy Phon (1970).

Fimbristylis dichotoma (L.) Vahl — Clump forming sedge in boggy vegetation indicating seasonal waterlogging on sandy soil beside track towards Popokvil Waterfall at 936 m, Middleton and Monyrak 654. Also listed by Rundel *et al.* (2003).

Fimbristylis eragrostis (Nees & Meyen) Hance — Reported by Dy Phon (1970) as *Fimbristylis lepidota* E.G.Camus from bogs as well as dry places.

Scleria ciliaris Nees — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Scleria harlandii Hance — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Scleria terrestris (L.) Fassett — Clump forming sedge in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 603.

Daphniphyllaceae

Daphniphyllum beddomei Craib — Tree, occasional in moist evergreen forests at higher elevations at 970–1,014 m (Tagane *et al.*, 2017). This species is included as a synonym of *Daphniphyllum paxianum* Rosenthal in the *Flora of China* but is recognized as distinct in the *Flora of Thailand*.

Daphniphyllum sp. — Dy Phon (1970) reported a species she called *Daphniphyllum roxburghii* H. Br. for which we can find no record, either of a specimen or publication. There is an illegitimate name *Daphniphyllum roxburghii* Baill. ex Rosenthal, now treated as *D. oldhamii* (Hemsl.) Rosenthal from Japan, Korea and China, but there is no evidence this species occurs in Cambodia. We are unsure of the identity of this species.

N.B. The genus *Daphniphyllum* deserves more study at Bokor. Tagane *et al.* (2017) list two additional species in middle elevation forests.

Droseraceae

Drosera burmannii Vahl — Small insectivorous herb in seasonally inundated area on sandy soil at 944 m, Middleton and Monyrak 588. Also listed by Rundel *et al.* (2003).

Drosera peltata Thunb. — Small insectivorous herb. Not seen by us but reported by Dy Phon (1970) from areas of seasonal wetlands.

Ebenaceae

Diospyros elephasii Lecomte — Small tree, common in moist evergreen forest on the top plateau. 962–1,043 m (Tagane *et al.*, 2017). Endemic to Bokor.

Diospyros venosa Wall. ex A.DC. — Tree in stunted forest. Reported by Dy Phon (1970). Tagane *et al.* (2017) used this name for a taxon at middle elevations below the plateau.

Elaeocarpaceae

Elaeocarpus bokorensis Tagane — Tree, common on the plateau from 800–1,000 m. (Tagane *et al.*, 2015). Endemic to Bokor.

Elaeocarpus dubius Aug.DC. — Tree, common in evergreen forest and its margin and roadside at 450–900(<1,000) m (rare on the plateau) (Tagane *et al.*, 2017).

Elaeocarpus griffithii (Wight) A.Gray — Tree, rare in moist evergreen forest on the plateau around 928 m (Tagane *et al.*, 2017).

Elaeocarpus lanceifolius Roxb. — Tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau around 1,055 m, Middleton and Monyrak 670.

Elaeocarpus thorelii Pierre — Small tree, rare, at higher elevation, around 970 m (Tagane *et al.*, 2017).

N.B. The genus *Elaeocarpus* deserves more study at Bokor to evaluate records. Tagane *et al.* (2017) list two unidentified taxa collected on the plateau. There are other species at middle elevations.

Ericaceae

Lyonia ovalifolia (Wall.) Drude — Tree in stunted forest. Reported by Dy Phon (1970) as *Pieris ovalifolia*. Also reported as rare in open bog on the plateau at 926 m by Tagane *et al.* (2017).

Rhododendron moulmainense Hook. — Shrub in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau around 1,047 m, Middleton and Monyrak 662. Tagane *et al.* (2017) identify this as *Rhododendron klossii* Ridl.

Vaccinium bracteatum Thunb. — Shrub or treelet in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau around 1,044 m, Middleton and Monyrak 659. Also reported by Tagane *et al.* (2017). Reported by Dy Phon (1970) as *Vaccinium cambodianum* Dop.

Vaccinium viscifolium King & Gamble — Small tree in thin soil on rocky ground by Popokvil Waterfall and near field station at the top of the plateau, 920–1,046 m, Middleton and Monyrak 622, 661. Also reported by Tagane *et al.* (2017) as occasional in moist evergreen forest on the plateau.

Eriocaulaceae

Eriocaulon ubonense Lecomte f. *kradungense* (Satake) A.Prajaksood & J.Parn. — Small herb in boggy vegetation indicating seasonal waterlogging on sandy soil beside track towards Popokvil Waterfall at 936 m, Middleton and Monyrak 628. Included as *Eriocaulon* cf. *henryanum* Ruhland in Rundel *et al.* (2003).

Escalloniaceae

Polyosma integrifolia Blume — Tree, occasional in evergreen forest at higher elevations around 944 m (Tagane *et al.*, 2017).

Euphorbiaceae

Croton phourinii H.Toyama & Tagane — Shrub, locally common in moist evergreen forest on the plateau at 930 m (Tagane *et al.*, 2017). Dy Phon (1970) reported a *Croton* sp. in the understorey of stunted forest. Endemic

to Bokor although its distinction from *Croton phaenodon* Airy Shaw was questioned by an anonymous reviewer.

Gymnanthes remota (Steenis) Esser — Small tree, occasional in moist evergreen forest at higher elevations around 960–1,014 m (Tagane *et al.*, 2017).

Macaranga andamanica Kurz — Small tree, common in moist evergreen forest on the plateau, especially frequent along streams at higher elevations, around 975–1,014 m (Tagane *et al.*, 2017).

Fabaceae

Codariocalyx gyroides (Roxb. ex Link) Hassk. — Shrub, occasional at semi-shaded forest margin on the plateau at 960 m (Tagane *et al.*, 2017).

Ormosia fordiana Oliv. — Tree in thin soil on rocky ground beside Popokvil Waterfall at 920 m, Middleton and Monyrak 624. Tagane *et al.* (2017) report an unidentified *Ormosia* on the plateau at 933 m.

Fagaceae

Castanopsis acuminatissima (Blume) A.DC — Tree, common at higher elevations around 970 m (Tagane *et al.*, 2017).

Castanopsis cambodiana A.Chev. ex Hickel & A.Camus — Tree, occasional in moist evergreen forest on the plateau at 935 m (Tagane *et al.*, 2017).

Lithocarpus elegans (Blume) Hatus. ex Soepadmo — Tree, rare in moist evergreen forest on the plateau at 1,000 m (Tagane *et al.*, 2017).

Lithocarpus elephantum (Hance) A.Camus — Tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 585. Also reported by Tagane *et al.* (2017) from moist evergreen forest at higher elevations, around 1,014–1,043 m.

Lithocarpus eriobotryifolius Yahara — Tree, occasional in moist evergreen forest at higher elevations around 930 m (Tagane *et al.*, 2017). Endemic to Bokor.

Lithocarpus farinulentus (Hance) A.Camus — Tree in stunted forest. Reported by Dy Phon (1970).

Lithocarpus leiophyllus A.Camus — Tree in sclerophyllous stunted forest on rocky sandy soil beside track towards Popokvil and near field station, at the top of the plateau at 1,043 m, Middleton and Monyrak 658. Also reported by Tagane *et al.* (2017) as fairly common and one of the dominant species in moist evergreen forest on the plateau.

Quercus augustinii Skan — Tree, occasional at higher elevations around 970 m (Tagane *et al.*, 2017).

Quercus langbianensis Hickel & A.Camus — Tree in stunted forest on the top plateau. Reported by Dy Phon (1970) and Tagane *et al.* (2017) as *Quercus cambodiensis* Hickel & A.Camus.

Quercus sp. — Tree, rare in evergreen forest at 970 m. Reported by Tagane *et al.*(2017).

N.B. The Fagaceae would appear to be in need of more detailed study at Bokor and throughout Indochina.

Flagellariaceae

Flagellaria indica L. — Woody climber in stunted forest. Reported by Dy Phon (1970).

Gentianaceae

Fagraea auriculata Jack — Tree, common in humid evergreen forest on the top plateau around 1,014 m. Reported y Dy Phon (1970) and Tagane *et al.* (2017).

Fagraea ceilanica Thunb. — Scandent tree, occasionally epiphyte, common in middle to high elevations around 1,014 m (Tagane *et al.*, 2017).

Gentiana greenwayae Merr. — Herbaceous perennial in heathland and stunted forest areas. Reported by Dy Phon (1970). Sometimes treated as *Gentiana praticola* subsp. *greenwayae* (Merr.) Halda.

Gentiana ting-nung-hoae Halda — Herbaceous perennial in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 607. Also listed by Rundel *et al.* (2003). *Gentiana bokorensis* Hul is a synonym of this species. It has also been treated as a subspecies of *Gentiana nudicaulis* Kurz. Endemic to Bokor.

Hanguanaceae

Hanguana cf. *malayana* (Jack) Merr. — Herb on sandy soil in stunted forest beside track on way to Popokvil Waterfall at 1,000 m, Middleton and Monyrak 604.

N.B. The genus *Hanguana* was, until recently, considered to be monotypic. Recent research in Malaysia and Singapore has led to the description of many new species and the conclusion that *Hanguana malayana* itself is likely quite narrowly distributed. It is quite possible that the Bokor plant is an undescribed species.

Juglandaceae

Engelhardia roxburghiana Lindl. ex Wall. — Tall tree found from low to high elevations (Tagane *et al.*, 2017).

Juncaceae

Juncus prismatocarpus R.Br. — Herbaceous perennial. Reported by Dy Phon (1970) from wetland areas with scattered subshrubs.

Lamiaceae

Anisochilus cambodianus Murata — Woody herb, rarely found on open sunny rocks on the plateau at 1,014 m (Tagane *et al.*, 2017).

Clerodendrum smitinandii Moldenke — Small tree, fairly common along forest edge and roadside around 970 m (Tagane *et al.*, 2017).

Premna interrupta Wall. ex Schauer — Scandent shrub, often epiphytic on tree trunks, occasional at higher elevations around 935 m (Tagane *et al.*, 2017).

Lauraceae

Beilschmiedia gammieana King ex Hook.f. — Tree, rare, at 1,014 m (Tagane *et al.*, 2017).

Beilschmiedia penangiana Gamble — Small tree, common in moist evergreen forest at higher elevations around 970–1,043 m (Tagane *et al.*, 2017).

Cassytha filiformis L. — Herbaceous scrambling parasite in stunted forest. Reported by Dy Phon (1970).

Cinnamomum bokorense Tagane & Yahara — Tree, occasional at middle elevations and reaching 935 m (Tagane *et al.*, 2017). Endemic to Bokor.

Cinnamomum curvifolium (Lour.) Nees — Tree, somewhat common in evergreen forest in middle and higher elevations around 970 m (Tagane *et al.*, 2017).

Cinnamomum dimorphandrum Yahara & Tagane — Small tree, somewhat common in moist evergreen forest at higher elevations, 941–1,043 m (Tagane *et al.*, 2017).

Cinnamomum iners Reinw. ex Blume — Treelet in heathland areas. Reported by Dy Phon (1970).

Cinnamomum litseifolium Thwaites — Tree in stunted forest. Reported by Dy Phon (1970).

Lindera bokorensis Yahara & Tagane — Small tree, rare, at 970 m (Tagane *et al.*, 2017). Endemic to Bokor.

Litsea cambodiana Lecomte — Tree in stunted forest. Reported by Dy Phon (1970). Tagane *et al.* (2017), however, describes this as a middle elevation tree not present on the plateau.

Litsea martabanica (Kurz) Hook.f. — Small tree, common in middle elevation evergreen forests and a single collection from 970 m (Tagane *et al.*, 2017).

Litsea monopetala (Roxb.) Pers. — Tree locally common in moist evergreen forest on the plateau around 928 m (Tagane *et al.*, 2017).

Litsea verticillata Hance — Small tree, somewhat common in evergreen forest at higher elevations around 1,014 m (Tagane *et al.*, 2017).

Litsea vang Lecomte — Tree in stunted forest. Reported by Dy Phon (1970).

Machilus bokorensis Yahara & Tagane — Small tree, common in moist evergreen and stunted forest on the top plateau on sandy soil at 936–1,056 m. Middleton and Monyrak 597, 629, 643. Also reported by Tagane *et al.* (2017). Reported by Dy Phon (1970) as *Machilus odoratissima* Nees. Endemic to Bokor.

Neolitsea aff. *alongensis* Lecomte — Tree in stunted forest. Reported by Dy Phon (1970).

Neolitsea bokorensis Yahara & Tagane, ined. — Small tree, common in moist evergreen forest on the plateau around 1,011–1,043 m (Tagane *et al.*, 2017). Presumably endemic to Bokor.

Neolitsea cambodiana Lecomte var. *cambodiana* — Small tree, locally common at higher elevations around 1,014–1,043 m (Tagane *et al.*, 2017).

Neolitsea cambodiana Lecomte var. *glabra* C.K.Allen — Tree in stunted forest. Reported by Dy Phon (1970).

Neolitsea zeylanica (Nees & T.Nees) Merr. — Sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 611. Tagane *et al.* (2017) restricts this name to a low elevation tree species.

N.B. The Lauraceae is a diverse family on both the plateau and lower elevations at Bokor. The Lauraceae of Cambodia, like the rest of Southeast Asia, is poorly known and in need of greater study.

Lentibulariaceae

Utricularia bifida L. — Tiny herb in boggy vegetation indicating seasonal waterlogging on sandy soil at 936 m, Middleton and Monyrak 641. Also listed by Rundel *et al.* (2003).

Utricularia caerulea L. — Small herb in boggy vegetation indicating seasonal waterlogging on sandy soil at 936 m, Middleton and Monyrak 640.

Utricularia delphinioides Thorel ex Pellegr. — Wet grassland. Reported by Dy Phon (1970).

N.B. In addition to the above species, blogs by F.S. Mey in 2011 report four additional species — *Utricularia minutissima* Vahl, *U. odorata* Pellegr., *U. striatula* Sm., and *U. uliginosa* Wight.

Loganiaceae

Mitrasacme pygmaea R.Br. — Small herb growing in cracks in disintegrating road beside sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,058 m, Middleton and Monyrak 673.

Loranthaceae

Barathranthus axanthus (Korth.) Miq. — Small parasitic shrub, scattered in evergreen forest at stunted and high elevation, around 940 m (Tagane *et al.*, 2017).

Macrosolen cochinchinensis (Lour.) Tiegh. — Semi-woody epiphytic parasite in stunted forest. Reported by Dy Phon (1970). Reported by Tagane *et al.* (2017) as occasional in hill evergreen forest at 800–1,000 m.

Lythraceae

Ammannia baccifera L. — Herbaceous perennial in wetland areas. Reported by Dy Phon (1970).

Magnoliaceae

Magnolia duperreana Pierre — Tree in stunted forest. Reported by Dy Phon (1970) as *Kmeria duperreana*. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest on the plateau around 939–1,014 m.

Magnolia liliifera (L.) Baill. — Small tree, common in moist evergreen forest on the plateau, around 1,014–1,043 m (Tagane *et al.*, 2017).

Magnolia sp. — A treelet in stunted forest on sandy soil beside a stream on way from road to Popokvil Waterfall at 934 m, Middleton and Monyrak 616.

Malvaceae

Pavonia rigida (Wall. ex Mast.) Hochr. — Herbaceous creeper. Reported by Dy Phon (1970) from heathland area as synonymous with *Urena rigida* Wall. Both genera may now be synonyms of *Hibiscus*.

Sterculia parviflora Roxb. ex G.Don — Tree, occasional in evergreen forest from middle to high elevations, around 1,014 m (Tagane *et al.*, 2017).

Melastomataceae

Medinilla rubicunda (Jack) Blume — Small tree, often epiphytic on tree trunks and rocks, somewhat common in moist evergreen forest on the plateau, around 1,014 m (Tagane *et al.*, 2017).

Melastoma malabathricum L. subsp. *normale* (D.Don) Karst. Mey. — Shrub in sclerophyllous stunted forest on rocky sandy soil near field station, near top of plateau at 1,049 m, Middleton and Monyrak 664. Reported by Dy Phon (1970) as *Melastoma normale*.

Melastoma pellegrinianum (H.Boissieu) Karst.Mey. — Shrub to small tree, common in disturbed semi-evergreen forest in lowland and open sunny bogs on the plateau, around 1,014 m (Tagane *et al.*, 2017).

Melastoma saigonense (Kuntze) Merr. — Wet grassland. Reported by Dy Phon (1970) as *Melastoma villosum* Sims which is a later homonym of *M. villosum* Aublet.

Melastoma sanguineum Sims — Woody shrub in heathland areas. Reported by Dy Phon (1970). Tagane *et al.* (2017) report this species only from disturbed forest margins at low and middle elevation.

Memecylon bokorense Tagane — Shrub to small tree, occasional in understorey of moist evergreen forest at higher elevations, especially common around Popokvil Waterfall (Tagane *et al.*, 2017). Endemic to Bokor.

Memecylon lilacinum Zoll. & Moritzi — Shrub in montane forests collected at 928 m (Tagane *et al.*, 2017).

Sonerila bokorense S.H.Cho and Y.D.Kim — Herbaceous perennial in stunted forest at 950–1,050 m. Endemic to Bokor and described by Cho *et al.* (2015).

N.B. Tagane *et al.* (2017) describes one unidentified species of *Memecylon* from 970 m on the plateau. More work on the Melastomataceae would help resolve species limits, with many taxa present at middle elevations.

Meliaceae

Aglaia spectabilis (Miq.) S.S.Jain & Bennet — Tree, occasional at higher elevations, around 970 m (Tagane *et al.*, 2017).

Dysoxylum cauliflorum Hiern — Tree, common in evergreen forest at all elevations, in particular along a stream at 970 m (Tagane *et al.*, 2017).

Dysoxylum sp. — Tall tree, occasional in primary forest at all elevations (Tagane *et al.*, 2017).

Toona ciliata M.Roem. — Tree, rare at higher elevations, around 970 m (Tagane *et al.*, 2017).

Menispermaceae

Hypserpa nitida Miers — Climber, occasional in moist evergreen forest on the plateau at 1,014–1,043 m (Tagane *et al.*, 2017).

Moraceae

Ficus consociata Blume — Small tree, often found near streams at higher elevations, around 970 m (Tagane *et al.*, 2017).

Ficus heteropleura Blume — Hemi-epiphytic shrub or tree, common in moist evergreen forest on the plateau, around 962–1,014 m (Tagane *et al.*, 2017).

Ficus ischnopoda Miq. — Subshrub in stunted forest. Reported by Dy Phon (1970). Tagane *et al.* (2017) records this species from open rapidly flowing streams at middle elevations but not the plateau.

Ficus sumatrana (Miq) Miq. — Tree in stunted forest. Reported by Dy Phon (1970).

Ficus sundaica Blume — Small tree, common in moist evergreen forest on the plateau, and also found in the lowlands (Tagane *et al.*, 2017).

Streblus indicus (Bureau) Corner — Small tree in stunted forest. Reported by Dy Phon (1970). Tagane *et al.* (2017) report it as a scandent or erect tree, common in moist evergreen forest, especially abundant along lower streamside of Popokvil Waterfall below 930 m.

Myristicaceae

Horsfieldia amygdalina (Wall.) Warb. — Tree, common in lowland, occasional in middle elevation, and rare on the plateau, around 970–1,014 m (Tagane *et al.*, 2017).

Myrtaceae

Decaspermum montanum Ridl. — Small tree, somewhat common in dense evergreen forest on the plateau, around 970–1,043 m (Tagane *et al.*, 2017).

Melaleuca leucadendra (L.) L. — Tree in boggy areas with saturated soils. Reported by Dy Phon (1970).

Rhodamnia dumetorum (DC.) Merr. & L.M.Perry — Shrub in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 657. Also reported by Tagane *et al.* (2017) as locally common in somewhat disturbed areas in both lower and higher elevations.

Rhodomyrtus tomentosa (Aiton) Hassk. — Shrub to small tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,048 m, Middleton and Monyrak 663. Also reported by Tagane *et al.* (2017) as occasional in disturbed areas in both lower and higher elevations.

Syzygium antisepticum (Blume) Merr. & L.M.Perry — Prostrate shrub to small tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,054 m, Middleton and Monyrak 669. Also reported by Tagane *et al.* (2017) as fairly common in evergreen forest at higher elevations and open sunny bog on the plateau. In the latter environment, this species grows as a dwarf shrub, 40 cm tall, having smaller and thicker leaves (Tagane *et al.*, 2017). Included as *Syzygium zeylanicum* (L.) DC. by Rundel *et al.* (2003).

Syzygium attenuatum (Miq.) Merr. & L.M.Perry — Small tree, occasional in dense evergreen forest at higher elevations, around 1,014–1,043 m (Tagane *et al.*, 2017).

Syzygium bokorense W.K.Soh & J.Parn. — Shrub on sandy soil in high rainfall area on way to Popokvil Waterfall at 936 m, Middleton and Monyrak 610, 630. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest and its margins on the plateau, around 1,014 m. Endemic to Bokor.

Syzygium claviflorum (Roxb.) Wall ex Steud. — Shrub to small tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,045 m, Middleton and Monyrak 660. Also reported by Tagane *et al.* (2017) as common in open bogs on the plateau, around 938–1,043 m.

Syzygium formosum (Wall.) Masam. — Small tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,056 m, Middleton and Monyrak 671. Also reported by Tagane *et al.* (2017) as fairly common along rapid streams and in swamp forests on the plateau.

Syzygium hancei Merr. & L.M.Perry — Small tree in thin soil on rocky ground beside Popokvil Waterfall at 920 m, Middleton and Monyrak 623. Tagane *et al.* (2017) treated this species as *Syzygium mekongense* (Gagnep.) Merr. & L.M.Perry.

Syzygium jambos (L.) Alston var. *sylvaticum* (Gagnep.) Merr. & L.M.Perry — Tree, somewhat common in middle and higher elevations, around 970 m (Tagane *et al.*, 2017).

Syzygium lineatum (DC.) Merr. & L.M.Perry — Tree in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 605. Also reported by Tagane *et al.* (2017) as somewhat commonly found in evergreen forest from low to high elevations on the plateau, around 1,014 m.

Tristaniopsis merguensis (Griff.) Peter G.Wilson & J.T.Waterh. — Common tree in stunted forest. Reported by Dy Phon (1970). Also reported by Tagane *et al.* (2017).

N.B. The genus *Syzygium* is a diverse group at Bokor, and questions remain about the species present on the plateau. Soh and Parnell (2015) recently revised the species for Indochina.

Nepenthaceae

Nepenthes bokorensis Mey — Herb in seasonally inundated area on sandy soil at around 944 m, Middleton and Monyrak 587, 589, 592, 602. Reported by Dy Phon (1970) as *Nepenthes thorelii* Lecomte. Listed as *Nepenthes kampotiana* Lecomte in Rundel *et al.* (2003). Endemic to Bokor.

Nyssaceae

Nyssa javanica (Blume) Wangerin — Tall tree in moist evergreen montane forests and reaching 928 m (Tagane *et al.*, 2017).

Ochnaceae

Campylospermum serratum (Gaertn.) Bittrich & M.C.E. Amaral — Shrub or treelet in scrubland or stunted forest in sandy soil near top of plateau at 936–1,056 m, Middleton and Monyrak 596, 612, 636. Also reported by Tagane *et al.* (2017) under the name *Gomphia serrata* (Gaertn.) Kanis as common in evergreen forest on the plateau.

Oleaceae

Jasminum lanceolaria Roxb. — Climber, somewhat common in both lower and higher elevations (Tagane *et al.*, 2017).

Jasminum nobile C.B.Clarke — Woody climber in stunted evergreen sclerophyllous forest along edge of track on plateau at 989–1,042 mm, Middleton and Monyrak 593, 625. Also reported by Tagane *et al.* (2017) as common in edge of evergreen forest on the plateau, around 1,014–1,043 m.

Olea brachiata (Lour.) Merr. — Tree, occasional in evergreen forest and its margins on the plateau around 970–1,043 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) as *Olea maritima* Wall. ex G.Don.

Olea salicifolia Wall. ex G.Don — Small tree, common in moist evergreen forest on the plateau, around 1,014–1,043 m (Tagane *et al.*, 2017).

Orchidaceae

Appendicula hexandra (J.Koenig) J.J.Sm. — Epiphytic orchid in stunted forest. Listed by Averyanov *et al.* (2013). Reported by Dy Phon (1970) as *Appendicula koenigii* Hook.f.

Bulbophyllum lobbii Lindl. — Lithophytic epiphyte in areas of stunted forest. Reported by Dy Phon (1970).

Bulbophyllum physocoryphum Seidenf. — Epiphytic orchid in evergreen forest on the plateau at 1,000 m. Reported by Averyanov *et al.* (2013).

Bulbophyllum retusiusculum Rchb.f. — Epiphytic orchid in evergreen forest on the plateau. Reported by Averyanov *et al.* (2013).

Bulbophyllum tenuifolium (Blume) Lindl. — Epiphytic orchid in evergreen forest on the plateau and common along streams. Reported by Averyanov *et al.* (2013).

Calanthe cardioglossa Schltr. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970) and collected by Averyanov *et al.* (2012).

Calanthe lyroglossa Rchb.f. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970) as *Calanthe nephroidea* Gagnep.

Calanthe spathoidea — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970). This name does not appear to have ever been published and it is not known to what it refers.

Ceratostylis subulata Blume — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970) as *Ceratostylis teres* (Griff.) Rchb.f.

Cleisostoma birmanicum (Schltr) Gerey — Epiphytic orchid. Stunted forest at 1,000 m (Schuiteman *et al.*, 2016).

Cleisostoma fuerstenbergianum Kraenzl. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970) as *Sarcanthus geoffrayi* Guillaumin.

Coelogyne parishii Hook.f. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970).

Conchidium muscicola (Lindl.) Rauschert — Epiphyte in areas of stunted forest. Reported by Dy Phon (1970) as *Eria muscicola* (Lindl.) Lindl.

Dendrobium revolutum Lindl. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970).

Dendrobium scabrilingue Lindl. — Epiphytic orchid in evergreen forest. Reported by Averyanov *et al.* (2016).

Dendrobium tenellum (Blume) Lindl. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970).

Eria biflora Griff. — Lithophytic or epiphytic orchid in stunted forest. Reported by Dy Phon (1970)

Eria lasiopetala (Willd.) Ormerod — Lithophytic or epiphytic orchid in stunted forest. Reported by Dy Phon (1970) as *Eria albidotomentosa* (Blume) Lindl.

Eria tenuiflora Ridl. — Epiphytic orchid in cloud forest on the plateau (Averyanov *et al.*, 2013).

Liparis acuminata Hook.f. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970).

Mycaranthes floribunda (D.Don) S.C.Chen & J.J.Wood. — Lithophytic or epiphytic orchid in stunted forest. Reported by Dy Phon (1970) as *Eria paniculata* Lindl.

Oberonia falcata King & Pantl. — Epiphytic orchid in evergreen montane forest at 940 m (Schuiteman *et al.*, 2016.

Papilionanthe pedunculata (Kerr) Garay. — Terrestrial orchid climber in stunted forest. Reported by Dy Phon (1970) as *Aerides pedunculata* Kerr.

Pholidota articulata Lindl. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970).

Plocoglottis bokorensis (Gagnep.) Seidenf. — Terrestrial herbaceous perennial. Submontane forests of Bokor. Reported by Nuraliev (2014) without elevation, but collected at 1,300 m at Khao Yai, Thailand.

Spathoglottis pubescens Lindl. — Terrestrial orchid in wetland areas and stunted forest. Reported by Dy Phon (1970).

Stichorkis gibbosa (Finet) J.J.Wood — Epiphytic orchid in evergreen montane forest at 940 m (Schuiteman *et al.* 2016).

Trichotosia velutina (Lodd. ex Lindl.) Kraenzl. — Epiphytic orchid in stunted forest. Reported by Dy Phon (1970) as *Eria velutina* Lodd. ex Lindl.

N.B. Averanov *et al.* (2013) collected a number of orchid species from Bokor without elevation data.

Pandanaceae

Pandanus capusii Martelli — Subshrub up to 80 cm. Stunted forest and heathland areas. Reported by Dy Phon (1970).

Pandanus cupribasalis H.St.John — Understorey of open forest stands, especially near Popokvil Waterfall. Typically 2–3 m in the lower forest stands but as tall as 8 m in wet forest at lower elevations (Stone, 1971).

Pentaphylacaceae

Anneslea fragrans Wall. — Tree, occasional on the top plateau, and rare in the lowland, around 1,011–1,043 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) as *Anneslea* sp.

Cleyera bokorensis Nagam. & Tagane, ined. — Rheophytic shrub to small tree, common along streams at higher elevations, around 991–1,043 m (Tagane *et al.*, 2017). Endemic to Bokor.

Eurya nitida Korth. var. *nitida* — Shrub in sclerophyllous stunted forest near field station, near top of plateau at 1,050 m, Middleton and Monyrak 665. This appears to be what Dy Phon (1970) reports as *Eurya japonica* Thunb. Tagane *et al.* (2017) report only *Eurya trichocarpa* Korth. from upper middle elevations and not the plateau.

Ternstroemia gymnanthera (Wight & Arn) Bedd. — Small tree, occasional in moist evergreen forest on the plateau, around 928–1,043 m (Tagane *et al.*, 2017).

Phyllanthaceae

Antidesma montanum Blume var. *montanum* — Small tree in dwarf forest on sandy soil beside track on way to Popokvil Waterfall at 1,000 m, Middleton and Monyrak 650. Also reported as *Antidesma montanum* by Tagane *et al.* (2017) as fairly common in moist evergreen forest on the plateau, around 930–1,014 m.

Aporosa yunnanensis (Pax & K.Hofm.) F.P.Metcalf — Tree, rare in evergreen forest at higher elevations, around 970 m (Tagane *et al.*, 2017).

Glochidion lanceolarium (Roxb.) Voigt — Tree 3–4 m tall. Stunted forest. Reported by Dy Phon (1970). Tagane *et al.* (2017) record this species only at low elevation.

Glochidion hypoleucum (MIq.) Boerl. — Tree in stunted forest. Reported by Dy Phon (1970) as *Glochidion glaucifolium* Müll.Arg.

Glochidion rubrum Blume — Small tree, occasional in edge of evergreen forest, around 930–1,014 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970).

Phyllanthus bokorensis Tagane — Small tree, common at streamside, especially along lower stream of Popokvil Waterfall, and in open areas on the plateau, around 1,014 m (Tagane *et al.*, 2017). Endemic to Bokor.

Phyllanthus kampotensis Beille — Shrub in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 645.

Phyllanthus roseus (Craib & Hutch.) Beille — Small tree, occasional in understorey of moist evergreen forest and its margin on the plateau at 1,014 m (Tagane *et al.*, 2017).

N.B. Both *Glochidion* and *Phyllanthus* require more careful study.

Pittosporaceae

Pittosporum balansae A.DC. — Shrub in understorey of stunted forest. Reported by Dy Phon (1970) as *Pittosporacus balansae*, possibly a typological error.

Pittosporum pauciflorum Hook. & Arn — Small tree, common in moist evergreen forest on the plateau, around 975–1,043 m (Tagane *et al.*, 2017).

N.B. More study may determine that these two taxa are the same.

Poaceae

Bambusa sp. — Edge of shrub stands in heathland area. Reported by Dy Phon (1970).

Eremochloa eriopoda C.E.Hubb. — Common grass in bog areas and seasonally waterlogged soils. Listed by Rundel *et al.* (2003).

Imperata cylindrica (L.) P.Beauv. — Forest edge and roadside. Reported by Dy Phon (1970).

Panicum sp. — Roadside. Reported by Dy Phon (1970). Also listed by Rundel *et al.* (2003).

Phragmites aff. *karka* (Retz.) Trin. ex Steud. — Common in disturbed areas at forest edge and roadside. Reported by Dy Phon (1970).

Polygalaceae

Polygala arillata Buch.-Ham. ex D.Don — Shrub, locally common around moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Polygala tonkinensis Chodat — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Salomonia longiciliata Kurz — Boggy vegetation indicating seasonal waterlogging on sandy soil beside track towards Popokvil Waterfall at 936 m, Middleton and Monyrak 639.

Xanthophyllum ellipticum Korth. ex Miq. — Small tree, scattered in moist evergreen forest and its vicinity on the plateau at 930 m (Tagane *et al.*, 2017).

Polygonaceae

Polygonum chinense L. — Herbaceous perennial. Reported by Dy Phon (1970) as common in heathland areas.

Primulaceae

Ardisia crenata Sims subsp. *crassinervosa* (E.Walker) C.M.Hu & Vidal — Treelet in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 642. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest and its vicinity on the plateau around 1,014 m.

Ardisia quinquegona Blume var. *quinquegona* — Small tree, occasional in evergreen forest from middle to high elevations, around 970–1,043 m (Tagane *et al.*, 2017).

Ardisia sanguinolenta Blume — Small tree, widely and commonly found from middle to high elevations (Tagane

et al., 2017). Reported by Dy Phon (1970) as *Ardisia colorata* Roxb.

Ardisia smaragdina Pit. — Shrub on sandy soil in scrubland near top of plateau at 1,056 m, Middleton and Monyrak 595. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest on the plateau, around 1,014–1,043 m.

Labisia pumila (Blume) Fern.-Vill. — Shrub, occasional in moist evergreen forest, often occurs near streams, around 941 m (Tagane *et al.*, 2017).

Maesa ramentacea (Roxb.) A.DC. — Shrub in understorey of stunted forest. Reported by Dy Phon (1970). Tagane *et al.* (2017) report this species from middle elevations.

Rapanea neriifolia (Siebold & Zucc.) Mez var. *macrocarpa* (Pit.) C.M.Hu — Tree, occasional in moist evergreen forest on the plateau, around 1,005–1,043 m (Tagane *et al.*, 2017).

Proteaceae

Helicia elephanti Sleumer — Shrub in stunted forest on the plateau. Reported by Dy Phon (1970). Also reported by Tagane *et al.* (2017) as a small tree, occasional along streams at higher elevations and particularly abundant along the lower stream of Popokvil Waterfall. Endemic to Bokor.

Helicia vestita W.W.Sm. — Tree, somewhat common in hill evergreen forest at 800–940 m (Tagane *et al.*, 2017).

Restionaceae

Centrolepis cambodiana Hance — Tufted herb on sandy soil in stunted forest beside inundated area on way to Popokvil Waterfall at 936 m, Middleton and Monyrak 632. Also listed by Rundel *et al.* (2003).

Dapsilanthus disjunctus (Mast.) B.G.Briggs & L.A.S.Johnson — Clump forming herb in boggy vegetation in seasonally inundated area beside track towards Popokvil Waterfall at 936 m, Middleton and Monyrak 655. Included as *Leptocarpus disjunctus* Mast. in Rundel *et al.* (2003).

Rhamnaceae

Frangula crenata (Siebold & Zucc.) Miq. — Shrub to small tree, common in open bog and its surroundings on the plateau, at 926 m (Tagane *et al.*, 2017).

Rosaceae

Prunus grisea (Blume ex Müll.Berol.) Kalkman var. *tomentosa* (Koord. & Valeton) Kalkman — Small tree, fairly common in moist evergreen forest on the plateau, and along the stream at higher elevations, 930–1,043 m (Tagane *et al.*, 2017).

Rhaphiolepis indica (L.) Lindl. — Small tree in thin soil on rocky ground beside Popokvil Waterfall at 920 m, Middleton and Monyrak 619. Also reported by Tagane *et al.* (2017) as fairly common in moist evergreen forest on the plateau, and along the stream at higher elevations, around 933–1,043 m.

Rhaphiolepis mekongensis (Cardot) Tagane & H.Toyama — Tree, common in moist evergreen forest on the plateau.

Rubus rugosus Sm. — Woody creeper. Reported by Dy Phon (1970) from heathland areas.

Rubus rosaefolius S.Vidal — Woody subshrub. Heathland areas. Reported by Dy Phon (1970).

Sorbus corymbifera (Miq.) T.H.Nguyên & Yakovlev — Tree in stunted forest. Reported by Dy Phon (1970) as *Sorbus granulosa* (Bertol.) Rehder. Also reported by Tagane *et al.* (2017) as occasional in moist evergreen forest on the plateau, around 988–1,014 m.

Rubiaceae

Argostemma fasciculata Sridith & Larsen — Perennial herb, in mixed shrubby sclerophyllous montane forest rich in epiphytes (Sridith & Larsen, 2004). Endemic to Bokor.

Canthium cambodianum Pit. — Small tree, rare in moist evergreen forest on the plateau, around 970–1,014 m (Tagane *et al.*, 2017).

Chassalia curviflora (Wall.) Thwaites — Treelet in heathland areas. Reported by Dy Phon (1970). Also reported by Tagane *et al.* (2017) as a shrub, commonly and widely found in the understorey of evergreen forest from middle to high elevations.

Coelospermum truncatum (Wall.) Baill. ex K.Schum. — Woody climber, somewhat common at higher elevations, at forest edge along roadside, around 1,014 m (Tagane *et al.*, 2017).

Gaertnera sralensis (Pierre ex Pit.) Kerr — Shrub in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,053 m, Middleton and Monyrak 668. Also reported by Tagane *et al.* (2017) as fairly common in understorey of moist evergreen forest at higher elevations, around 1,014–1,043 m.

Gynochthodes sublanceolata Miq. — Climber, occasional in moist evergreen forest at higher elevations, around 970 m (Tagane *et al.*, 2017).

Hedyotis rosmarinifolia (Pit.) Craib — Herb with woody base in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,065 m, Middleton and Monyrak 580. Also listed by Rundel *et al.* (2003).

Hedyotis scandens Roxb. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Ixora brunonis Wall. ex G.Don subsp. *kratensis* (Craib) Chamch. — Shrub, somewhat common in understorey of moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Ixora villosa Roxb. var. *chevalieri* Pit. — Shrub in stunted evergreen sclerophyllous forest along edge of track on plateau at 989 m, Middleton and Monyrak 594.

Lasianthus cambodianus Pit. — Shrub, occasional in moist evergreen forest at higher elevations, around 935 m (Tagane *et al.*, 2017).

Lasianthus chinensis (Champ.) Benth. — Shrub, occasional in moist evergreen forest and its vicinity, around 960–1,014 m (Tagane *et al.*, 2017).

Lasianthus chrysoneurus (Korth.) Miq. — Shrub in understorey of stunted forest. Reported by Dy Phon (1970) as *Lasianthus hoaensis* Pierre ex Pit. Tagane *et al.* (2017) record this only at upper middle elevations.

Lasianthus curtisii King & Gamble. — Shrub occasional at higher elevations around 928 m (Tagane *et al.*, 2017).

Lasianthus fordii Hance. — Shrub, common in understorey of evergreen forest at higher elevations, around 962 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) as *Lasianthus kamputensis* Pierre ex Pit.

Lasianthus giganteus Naiki — Treelet in moist evergreen forest, locally abundant near Popokvil sphagnum bog at 960 m (Tagane *et al.*, 2017).

Lasianthus hirsutus (Roxb.) Merr. — Shrub, commonly and widely found from stunted to high elevations, around 970–1,014 m (Tagane *et al.*, 2017).

Lasianthus inodorus Blume — Shrub, occasional at higher elevations, around 935 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) as *Lasianthus poilanei* Pit.

Lasianthus sp. — Shrub, occasional at higher elevations, around 941–970 m. Reported as "*Lasianthus* sp. 3" by Tagane *et al.* (2017).

Mussaenda cambodiana Pierre ex Pit. — Climber, common at the margin of evergreen forest in middle to high elevations, around 930–1,043 m (Tagane *et al.*, 2017). Probably the same as Middleton and Monyrak 672 from sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,057 m.

Oldenlandia tenelliflora (Blume) Kuntze — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970) as *Borreria stricta* (L.f.) K.Schum.

Ophiorrhiza sanguinea Blume — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970)

Pavetta graciliflora Wall. ex Ridl. — Shrub to small tree, common in moist evergreen forest and its margin at higher elevations, around 940–1,014 m (Tagane *et al.*, 2017).

Prismatomeris tetrandra (Roxb.) K.Schum. subsp. *tetrandra* — Small tree, somewhat common and widely found in evergreen forest, around 970 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) as *Prismatomeris albidiflora* Thwaites.

Psychotria asiatica L. — Shrub, occasional in evergreen forest and its vicinity at higher elevations, around 960 m (Tagane *et al.*, 2017).

Psychotria sarmentosa Blume var. *membranacea* (Pit.) P.H.Hô — Climber, scattered in moist evergreen forest at higher elevations, around 1,014 m (Tagane *et al.*, 2017).

Psychotria serpens L. — Climber, occasional in moist evergreen forest at higher elevations, around 974–1,043 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970).

Psychotria sp. — Treelet in stunted forest on sandy soil beside track on way to Popokvil Waterfall at 1,000 m, Middleton and Monyrak 653.

Psydrax sp. — Climber, occasional in moist evergreen forest at higher elevations, around 1,014 m (Tagane *et al.*, 2017).

Tarenna quocensis Pit. — Shrub to small tree, occasionally found in middle to high elevations (Tagane *et al.*, 2017).

N.B. The Rubiaceae is a particularly large and difficult family. Further study is necessary to ensure the same species concepts are used by each author.

Rutaceae

Acronychia pedunculata (L.) Miq. — Shrub or treelet in sclerophyllous stunted forest on rocky sandy soil near field station, at the top of the plateau at 1,042 m, Middleton and Monyrak 609, 667. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest at higher elevations, around 1,014–1,043 m .

Melicope lunu-ankenda (Gaertn.) T.G.Hartley — Tree, locally common in moist evergreen forest on the plateau at 928 m (Tagane *et al.*, 2017). This appears to be what was reported by Dy Phon (1970) as *Euodia triphylla* (Lam.) DC., although Tagane *et al.* (2017) also report another species, *Melicope pteleifolia* (Champ. ex Benth.) T.G.Hartley, in the upper montane forest.

Salicaceae

Casearia grewiifolia Vent. var. *grewiifolia* — Small tree, rare in moist evergreen forest and its margin on the plateau at 970 m (Tagane *et al.*, 2017).

Homalium cochinchinensis (Lour.) Druce — Small tree, locally common in moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Santalaceae

Dendrotrophe varians (Blume) Miq. — Woody climbing root parasite in moist evergreen forest at higher elevations, around 1,014 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) from heathland areas.

Sapindaceae

Guioa diplopetala (Hassk.) Radlk. — Treelet on sandy soil in high rainfall area in stunted forest beside inundated

area on way to Popokvil Waterfall at 936 m, Middleton and Monyrak 631. Also reported by Tagane *et al.* (2017) as common in moist evergreen forest on the plateau at 1,014 m.

Mischocarpus pentapetalus (Roxb.) Radlk. — Tree, commonly found in middle to high elevations, around 970–1,043 m (Tagane *et al.*, 2017).

Mischocarpus sundaicus Blume — Tree, occasional at higher elevations, around 935 m (Tagane *et al.*, 2017).

Nephelium hypoleucum Kurz — Tree in stunted forest on sandy soil beside track on way to Popokvil Waterfall at 1,000 m, Middleton and Monyrak 649. Also reported by Tagane *et al.* (2017) as common in evergreen forest at 970 m.

Schisandraceae

Illicium cambodianum Hance — Small tree, common in moist evergreen forest at higher elevations, around 935–1,043 m (Tagane *et al.*, 2017).

Illicium griffithii Hook.f. & Thomson — Treelet to 1.5 m in heathland areas. Reported by Dy Phon (1970). This may be the same as *Illicium tenuifolium* (Ridl.) A.C.Sm., a locally common shrub in moist evergreen forest in upper middle elevations reported by Tagane *et al.* (2017).

Schoepfiaceae

Schoepfia fragrans Wall. — Small tree, scattered in moist evergreen forest on the plateau, around 1,014–1,043 m (Tagane *et al.*, 2017).

Smilacaceae

Heterosmilax paniculata Gagnep. — Climber, common in evergreen forest from middle to high elevations (Tagane *et al.*, 2017).

Smilax cambodiana Gagnep. — Semi-woody climber. Reported by Dy Phon (1970) from stunted forest areas.

Smilax corbularia Kunth subsp. *corbularia* — Climber, common in moist evergreen forest on the plateau, around 941–1,043 m (Tagane *et al.*, 2017).

Smilax davidiana A.DC. — Climber on sandy soil in scrubland near the top of the plateau at 1,056 m, Middleton and Monyrak 601.

Smilax glabra Roxb. — Climber, common in moist evergreen forest at higher elevations, around 991–1,014 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) from heathland areas.

Smilax inversa T.Koyama — Climber, rare in moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017).

Smilax lanceifolia Roxb. — Climber, common in moist evergreen forest and its vicinity on the plateau, around 975–1,014 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) from heathland areas.

N.B. The genus *Smilax* is diverse at Bokor and deserving of more detailed study. Tagane *et al.* (2017) report four undescribed species, including two that occur on the plateau.

Stemonuraceae

Gomphandra cambodiana Pierre ex Gagnep. — Tree, occasional in evergreen forest at higher elevations, around 935 m (Tagane *et al.*, 2017).

Symplocaceae

Symplocos caudata Wall. ex G.Don — Small tree, occasional in moist evergreen forest at middle and high elevations, 975–1,014 m (Tagane *et al.*, 2017).

Symplocos theifolia D.Don — Small tree, occasional in evergreen forest from middle to high elevations (Tagane *et al.*, 2017). This species was reported as *Symplocos lucida* (Thunb.) Siebold & Zucc. by Nooteboom & Vidal (1977) but that is an illegitimate name.

Theaceae

Schima wallichii (DC.) Korth. — Shrub to small tree in stunted forest on sandy soil near summit on roadside towards research centre, 936–1,060 m, Middleton and Monyrak 633, 648. 675. Tagane *et al.* (2017) and Dy Phon (1970) treat this as *Schima crenata* Korth., a name considered to be a synonym in the Flora of Thailand.

Thymeleaceae

Eriosolena composita (L.f.) Tiegh. — Shrub or tree, occasional in edge of moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017). Reported by Dy Phon (1970) as *Daphne composita* (L.f.) Gilg.

Wikstroemia bokorensis E.Oguri & Tagane, ined. — Shrub, rare in edge of moist evergreen forest on the plateau at 1,014 m (Tagane *et al.*, 2017). Presumably endemic to Bokor.

Wikstroemia longifolia Lecomte — Shrub, occasional in edge of moist evergreen forest on the plateau, 963–1,014 m (Tagane *et al.*, 2017).

Verbenaceae

Lantana camara L. — Stunted woody subshrub along roadsides in heathland area. Reported by Dy Phon (1970). Naturalized non-native.

Vitaceae

Cayratia japonica (Thunb.) Gagnep. var. *mollis* (Wall. ex M.A.Lawson) Momiy. — Herbaceous climber, common along edge of evergreen forest in middle elevation at 970 m (Tagane *et al.*, 2017).

Tetrastigma ramentaceum Planch. — Semi-woody climber, somewhat common in moist evergreen forest on the plateau, 970–1,063 m (Tagane *et al.*, 2017). Reported by Dy Phon from heathland and stunted forest areas.

Xyridaceae

Xyris complanata R.Br. — Herbaceous perennial in open wetlands and bogs. Reported by Dy Phon (1970) and Rundel *et al.* (2003).

Zingiberaceae

Alpinia oxyphylla Miq. — Rare herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Amomum repoeense Pierre ex Gagnep. — Herbaceous perennial in stunted forest. Reported by Dy Phon (1970).

Globba bokorensis Nob.Tanaka & Tagane — Herbaceous perennial, occasional in open Sphagnum bog and semi-shaded moist evergreen forests on the plateau, often epiphytic on trunk and rocks (Tanaka *et al*., 2015). Endemic to Bokor.

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