



Investigation Species of Edible Tree and Medicinal Plants in Faculty of Agriculture, Khon Kaen University

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Abstract The objective of this study was conducted in Faculty of Agriculture, Khon Kaen University to investigate species, distribution and the usage of edible trees and medicinal plants and finding some guideline to conservation. The Check-List Survey was used and only more than 1.30 m. of height and more than 4.5 cm. of diameter at breast height (DBH) in both of edible trees and medicinal trees were identified and documented. The results showed that the overall of tree species in Faculty of Agriculture, Khon Kaen University are 57 species and 28 families which divided to edible trees 37 species, 12 families and medicinal trees are 55 species, 26 families. In addition to edible part are fruit, leaf, flower, inside-outside seed, bark and root. While, whole plant part including bark, leaf, root, stem, fruit, flower, seed, resin, petiole and polen was used as medicinal trees useful in the treatment of illness and any diseases. The distribution of edible trees and medicinal trees in this area varied primary forest (dry dipterocarp forest and dry evergreen forest) which no reforestation and conservation. This study indicated that edible trees and medicinal trees are valuable resources for improving not only food and nutritional security of households living but also ecological system. Therefore, more concern and should be enhanced the *In-situ* conservation of edible trees and medicinal trees through the participation of both faculty members and university members.

Keywords species and distribution, edible tree, medicinal tree

INTRODUCTION

Forest is an important productive sector effects on the natural balance of the remaining ecosystems and improvement of rural livelihoods (Sarma et. al., 2010; Mbuvi and Boon, 2009). Many plant species in the forest provide an adequate level of nutrition, food security, medicine and also income generation. In recently, the natural resources of Thailand are decreasing in every year, especially forest areas. Rapid environment changes typically cause extinctions, the species diversity of Thailand forest ecosystems. The forest ecosystems should be maintained by managing the sustainable management strategies to protect forest biodiversity which understood on the structure, ecology, behavior and reproduction of dominant tree species (Lamotte et al., 1998).

In the university area; Khon Kaen University, Thailand, the trend of the forest land was decreased causes of university development strategies with lack of good maintain and management, which affect to change of forest structure and endanger plant species in primary forest; dry dipterocarp forest and dry evergreen forest. Biodiversity survey in many natural locations such as national park, conservation forest and community forest area were done by many researchers but biodiversity or species inventory of university area is still neglected.

Therefore, the aim of the present study was to surveying the plant diversity, distribution and valuable of plant in Faculty of Agriculture, Khon Kaen University, Thailand, used the forest

inventory technique to highlights the edible and medicinal tree resource and finding some conservation guideline would be help to maintain ecosystem, food security and also reduced global warming.

METHODOLOGY

Study area: The study site is located in Faculty of Agriculture, Khon Kaen University, Khon kaen province Thailand at zone 48N with UTM coordinate $18^{\circ} 22' 78.4''$ N and $26^{\circ} 75' 04''$ E, 224 meters above sea level. The area encompasses 0.08 km² with two dominant forest type which are dry dipterocarp forest (DDF) and dryevergreen forest (Fig. 1).

Tree measurements: Trees with a diameter –dbh-at breast height more than 4.5 cm. and more than 1.3 m of height were numbered, recorded its name and measured or estimated its height. The diameter at breast height (DBH) was measured using a girth measurement. Height was measured using a hypsometer when necessary. Photographs of trees habitat were taken and geographic coordinates of each tree was also recorded using global positioning system (GPS; Garmin 60 CX).

The identification of trees was done through various available resources including World Wide Web and expertise available in the department of national parks, wildlife and plant conservation.

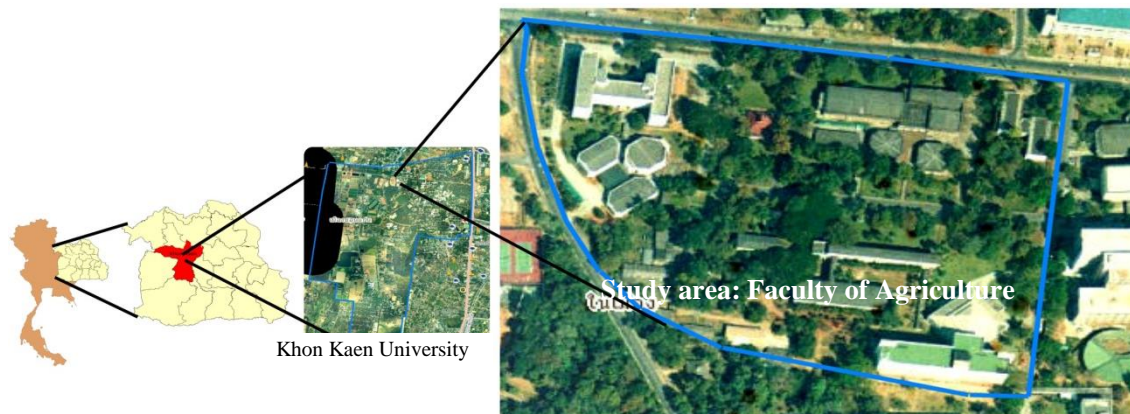


Fig. 1 Study area of faculty of agriculture, Khon Kaen University, Thailand

RESULTS AND DISCUSSION

The Forest inventory at Faculty of Agriculture, Khon Kaen University, Thailand indicated that, two types of forest; dry dipterocarp forest (DDF) and dry evergreen forest (DEF) was found. In over all, 57 species belonging to 28 families were observed and arranged according to their forest type consisting of 51 species were found in DDF, whereas DEF has only six specific species (Table 1). The value products that are used from these tree species include fruits, seeds, leaf, bark, flower, root, stem, petiole, pollen and resins. Of these, 37 species belong to 12 families of edible trees were reported to be used as vegetables, food and fruits. Fruits and leaves are the most dominant parts as found from 23 and 12 species, respectively (Fig. 2). While, the medicinal trees were found 55 species belong to 26 families which have potential value for traditional medicine of northeast region of Thailand. Bark is the most dominant part use as a medicine source which found in 34 species. Leaves placed in the second positions next to the bark that have been reduced by 25 species (Fig. 2).

Besides, the distribution of all trees both edible and medicinal tree on study area varied primary forest (dry dipterocarp forest). South area of Faculty of Agriculture is rich in medicinal trees such as *Shorea obtuse*, *Xylia xylocarpa*, *Morinda coreia* and *Pterocarpus indicus*. While, tree which identified as both edible and medicine tree was found around Faculty of Agriculture (Fig. 3).

Table 1 Valuable tree species at the Faculty of Agriculture, Khon Kaen University, Thailand

Species	Family	Local uses*	Edible	Medicinal
DDF				
<i>Lannea coromandelica</i> (Houtt.) Merr.	ANACARDIACEAE	Lf, Br, Rt	Yes	Yes
<i>Mangifera indica</i> L.	ANACARDIACEAE	Lf, Fl, Fr	Yes	Yes
<i>Buchanania latifolia</i> Roxb.	ANACARDIACEAE	Fr, Sd, Rt, La	Yes	Yes
<i>Melodorum fruticosum</i> Lour.	ANNONACEAE	Lf, Sd, Rt, Po	No	Yes
<i>Canaga odorata</i> Hook. f & Th	ANNONACEAE	Lf, Fl, S	No	Yes
<i>Polythia longifolia</i> (Benth.) Hook.f.	ANNONACEAE	Lf	No	Yes
<i>Wrightia arborea</i> (Dennst.) Mabb.	APOCYNACEAE	Lf, Br, Fl, Rt, La, S	Yes	Yes
<i>Astonia scholaris</i> (L.) R.Br.	APOCYNACEAE	Lf, Br, Rt	No	Yes
<i>Millingtonia hortensis</i> L.f.	BIGNONIACEAE	Lf, Fl, Rt	Yes	Yes
<i>Oroxylum indicum</i> (L.) Kurz	BIGNONIACEAE	Lf, Br, Fl, Fr, Rt, Sd	Yes	Yes
<i>Crescentia cujete</i> L.	BIGNONIACEAE	Br, Fr	No	Yes
<i>Bombax anceps</i> Pierre varanceps .	BOMBACACEAE	Br, Fl	Yes	No
<i>Canarium subulatum</i> Guillaumin	BURSERACEAE	Fr, S	Yes	Yes
<i>Terminalia cacappa</i> L.	COMBRETACEAE	Lf, Br, Fr, Sd	Yes	Yes
<i>Shorea obtusa</i> Wall.ex Blume	DIPTEROCAPACEAE	Br, Fl	Yes	Yes
<i>Dipterocarpus intricatus</i> Dyer	DIPTEROCAPACEAE	Br, Fl, La	Yes	Yes
<i>Phyllanthus acidus</i> (L.) Skeels	EUPHORBIACEAE	Lf, Fr, Rt	Yes	Yes
<i>Calophyllum inophyllum</i> L.	GUTTIFERAE	Fl, Sd, La	No	Yes
<i>Mammea harmandii</i> Kosterm.	GUTTIFERAE	Fl, Fr	Yes	Yes
<i>Tectona grandis</i> L.f.	LABIATAE	Lf, S	No	Yes
<i>Caesalpinia coriaria</i> Willd.	LEGUMINOSAE	Fr	No	Yes
<i>Albisia lebeck</i> (L.) Benth.	LEGUMINOSAE-MIMOSOIDEAE	Lf, Br, Sd	Yes	Yes
<i>Senna siamea</i> (Lam.) Irwin & Barneby	LEGUMINOSAE-CAESALPINIOIDEAE	Lf, Br, Fl, Rt	Yes	Yes
<i>Tamarindus indica</i> L.	LEGUMINOSAE-CAESALPINIOIDEAE	Lf, Br, Fl, Fr	Yes	Yes
<i>Sindora siamensis</i> Teijsm. & Miq.	LEGUMINOSAE-CAESALPINIOIDEAE	Br, Sd	Yes	Yes
<i>Azalia xylocarpa</i> (Kurz) Craib	LEGUMINOSAE-CAESALPINIOIDEAE	Br, Sd, S	Yes	Yes
<i>Bauhinia purpurea</i> L.	LEGUMINOSAE-CAESALPINIOIDEAE	Lf, Br, Fl, Rt, Sd	Yes	Yes
<i>Cassia bakeriana</i> Craib	LEGUMINOSAE-CAESALPINIOIDEAE	Br, Fr, Sd	Yes	Yes
<i>Cassia spectabilis</i> DC.	LEGUMINOSAE-CAESALPINIOIDEAE	Rt	No	Yes
<i>Cassia fistula</i> L.	LEGUMINOSAE-CAESALPINIOIDEAE	Lf, Br, Fl, Fr, Rt, Sd	No	Yes
<i>Phyllocarpus septentrionalis</i> Donn.Sm	LEGUMINOSAE-CAESALPINIOIDEAE	Lf, Br, Rt	No	Yes
<i>Erythrina variegata</i> L.	LEGUMINOSAE-PAPILIONOIDEAE	Lf, Br, Rt	Yes	Yes
<i>Pterocarpus indicus</i> Willd.	LEGUMINOSAE-PAPILIONOIDEAE	Lf, Br, Sd, S, La	No	Yes
<i>Pterocarpus macrocarpus</i> Kurz	LEGUMINOSAE-PAPILIONOIDEAE	Lf, Br, S	No	Yes
<i>Lagerstroemia floribunda</i> Jack	LYTHRACEAE	Br, Rt	No	Yes
<i>Lagerstroemia speciosa</i> (L.) Pers.	LYTHRACEAE	Lf, Br	No	Yes
<i>Lagerstroemia loudonii</i> Teijsm. & Binn	LYTHRACEAE	Br	No	Yes
<i>Michelia champaca</i> L.	MAGNOLIACEAE	Lf, Br, Fl, Rt, S	No	Yes
<i>Swietenia macrophylla</i> King	MELIACEAE	Lf, Br, Fl	Yes	Yes
<i>Azadirachtaindica</i> A.Juss. var. <i>siamensis</i> Valetton	MELIACEAE	Lf, Br, Fl, Fr, Rt, Pt,	Yes	Yes
<i>Xylia xylocarpa</i> (Roxb.) Taub. Var.	MIMOSACEAE	Br, Fl, Sd	Yes	Yes
<i>Artocarpus heterophyllus</i> Lam.	MORACEAE	Lf, Fr, Sd, S, La	Yes	Yes
.Roxb <i>Artocarpus lacucha</i>	MORACEAE	Br, Rt, S	Yes	Yes
<i>Averrhoa carambola</i> L.	OXALIDACEAE	Lf, Br, Fr, Rt,	Yes	Yes
<i>Morinda coreia</i> Ham.	RUBIACEAE	Lf, Fr, S	Yes	Yes
<i>Haldina cordifolia</i> (Roxb.) Ridsdale	RUBIACEAE	Lf, Rt	No	Yes
<i>Schleichera oleosa</i> (Lour.) Oken	SAPINDACEAE	Br, Fr	Yes	Yes
<i>Lepisanthes rubiginosa</i> (Roxb.) Leenh.	SAPINDACEAE	Fr, Rt, Sd	Yes	Yes
<i>Litchi chinensis</i> Somn	SAPINDACEAE	Fr, Sd	Yes	Yes
<i>Mimusops elengi</i> L.	SAPOTACEAE	Lf, Br, Fl, Fr, Rt	Yes	Yes
<i>Drychnos nux-vomica</i> L.	STRYCHNACEAE	Br, Fr, Sd	Yes	Yes
DEF				
<i>Peltophorum pterocarpum</i> (DC.) Backer ex K.Heyne	CAESALPINIACEAE	Lf, Br	Yes	Yes
<i>Dipterocarpus alatus</i> Roxb.	DIPTEROCAPACEAE	Lf	No	Yes
<i>Dipterocarpus tuberculatus</i> Roxb.	DIPTEROCAPACEAE	Lf, Rt, S	No	Yes
<i>Sandoricum koetjape</i> (Burm.f.) Merr.	MELIACEAE	Lf, Br, Fr, Rt	Yes	Yes
<i>Syzygium cumini</i> (L.) Skeels	MYRTACEAE	Br, Fr	Yes	Yes
<i>Grewia eriocarpa</i> Juss.	TILIACEAE	Fr	Yes	No

* Br: Bark, Fl: Flower, Fr: Fruit, La: Latex, Lf: Leaf, Po: Pollen, Pt: Petiole, Rt: Root and tuber, S: Stem, Sd: Seed

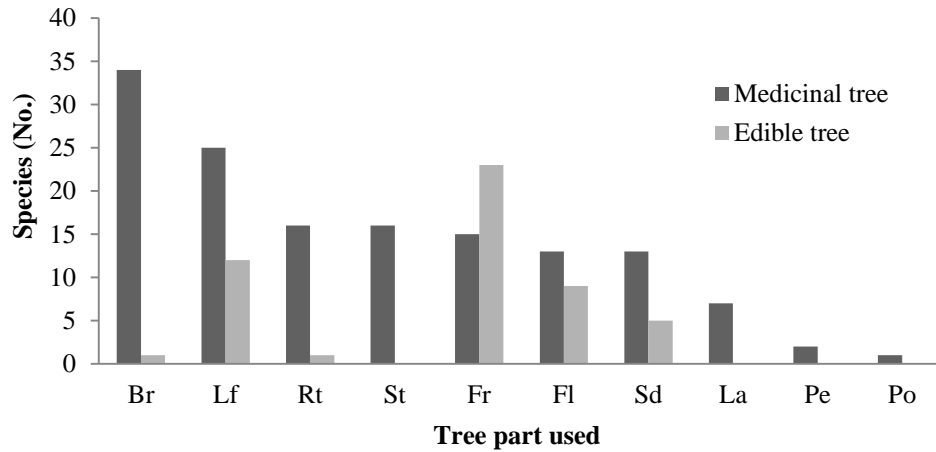


Fig. 2 Different usable parts of trees of Faculty of Agriculture, Khon Kaen University, Thailand

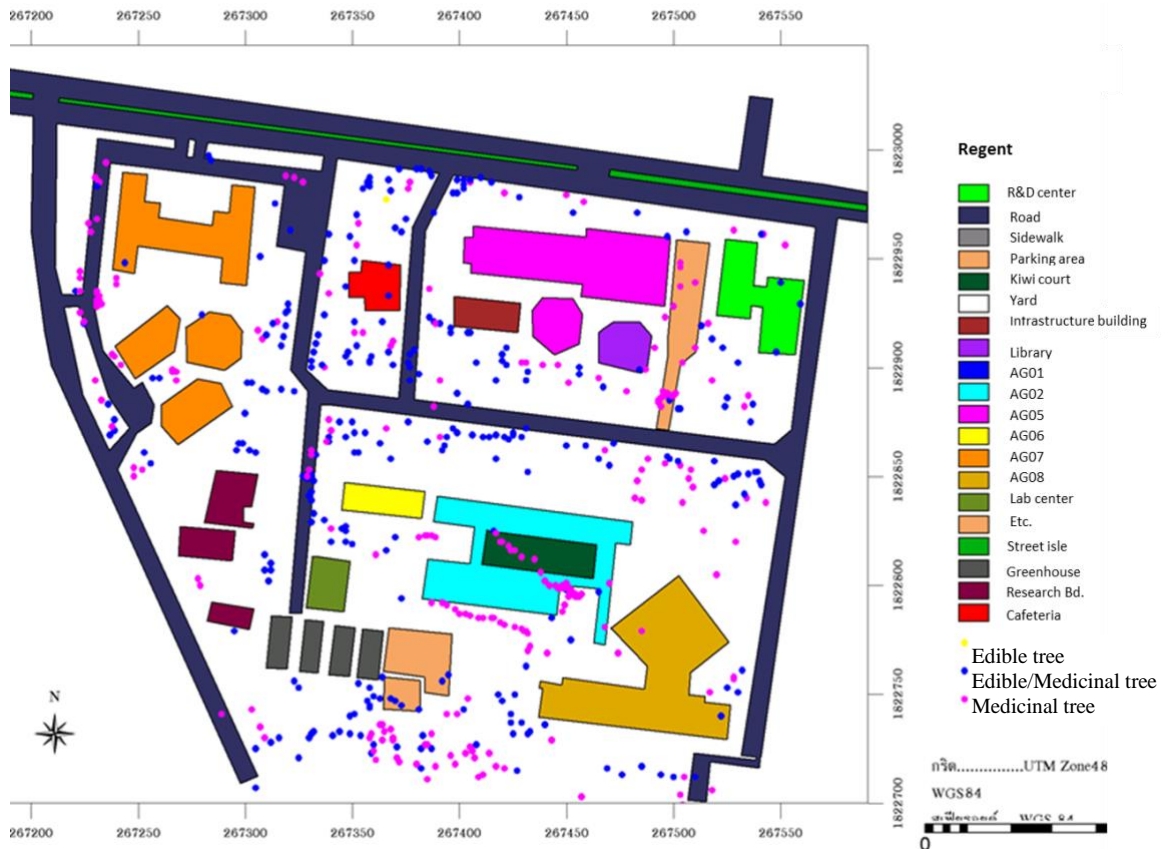


Fig. 3 The distribution of edible and medicinal tree in Faculty of Agriculture, Khon Kaen University, Thailand

In northeast region, the DDF and the DEF are two important of the forest dynamics in dry forests of Thailand with very different ecosystems while existing in similar climatic regions (Lamotte et. al., 1998). Chantaranothai and Sanoamuang (2002) found that the most of forest type in Khon Kaen University area is DDF which fertile and high biodiversity and more than 80% of DDF tree species was found in this area. However, deforestation for various reasons was occurred during the university development system. Therefore, many valuable trees were extinct from this area. Similar to this study which forest inventory and identify trees in Faculty of Agriculture, Khon Kaen Universtiy was divided into DDF and DEF. The DDF species was higher than DEF species

because the DDF as being strongly adapted phonologically, physiologically and physiologically, to the dry season burns which so characterize their environment (Stoott, 1988).

This study revealed also a need for controlling forest conservation in the university area in term of plant biodiversity. Planting of edible and medicinal tree should be promoted, strongly encouraged and supported from the university and faculty board and also all of university and faculty members.

CONCLUSION

The natural ecosystems hold important plant genetic resources of edible and medicinal tree in Faculty of Agriculture, Khon Kaen University, which if good management can serve a sustainable resources include food security, good environmental would be reduced as climate change. An urgent need, for conservation of both edible and medicinal tree species in two forest types, their habitats, indigenous knowledge and member's participatory, is required.

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