Field Guidebook on Native Trees within the Quirino Forest Landscape

Elizabeth Tomas-Carig

Field Guidebook on Native Trees within the Quirino Forest Landscape

Elizabeth Tomas-Carig

Field Guidebook on Native Trees within the Quirino Forest Landscape

Elizabeth Tomas-Carig, Ph.D.

Researchers
Irene D. Dimmangna, RF
Liwliwa F. Mamaoag, RF
Joel G. Carig, MSF

Forest Assessment Team
Ryan P. Manuel, Ph.D.
Joel G. Carig, MSF
Romnick L. Pascua, MSF
Franklin C. Dulnuan, RF
Genita L. Pasion, RF

Photographers and Lay-out Artists
Irene D. Dimmangna, RF
Liwliwa F. Mamaoag, RF
Gerlyn B. Orpiano, RF

Maps
Anjo Mar P. Tuazon, RF

Support Staff
Jesa Jane F. Sales
Virgilio B. Pumacsao

QSU Compound, Andres Bonifacio, Diffun, Quirino
Email: elizabeth.carig@qsu.edu.ph

ISBN 978-971-014-693-2

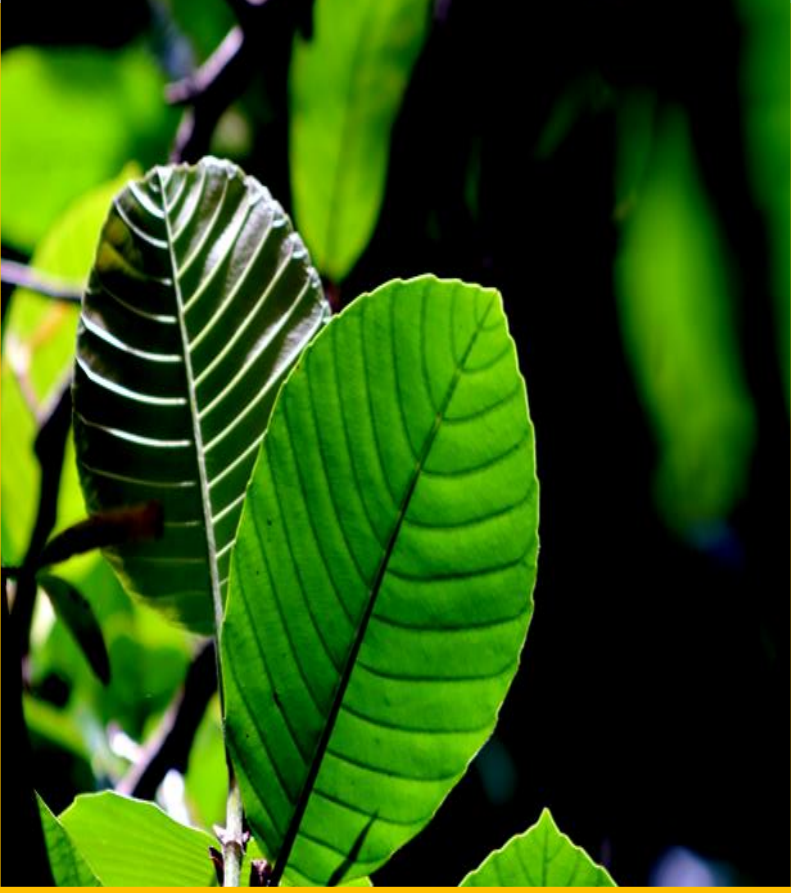
This publication is produced for the project "Multi-Stakeholders Collaboration for the Sustainable Management of Quirino Forest Landscape".

Published and Printed by:

St. Andrew PUBLISHING HOUSE
316 Culianin, Plaridel, Bulacan • Tel. #: (044) 794-1020 / (044) 896-2070
Email add.: st.andrewpublishinghouse@yahoo.com
st.andrewpublishinghouse@gmail.com

Official Member: NBDB NATIONAL BOOK DEVELOPMENT BOARD

Seed/seedling of White Lauan



Field Guidebook on Native Trees within the Quirino Forest Landscape

ELIZABETH T. CARIG

Published, Copyrighted 2020, and distributed by

St. Andrew Publishing House

located at 369 Culianin, Plaridel, Bulacan with

Tel. No.: (044) 794-1020 / (044) 896-2070

Email add.:

st.andrewpublishinghouse@yahoo.com

st.andrewpublishinghouse2019@gmail.com

ISBN 978-971-014-693-2

St. Andrew Publishing House is an official member of the ***National Book Development Board*** (NBDB) with office at A. Maria Regidor St., Area XI,

University of the Philippines, Diliman, Quezon City, Philippines

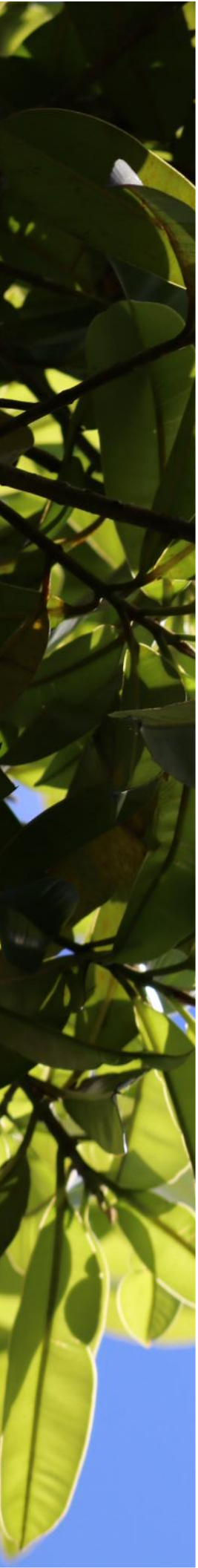
Callophylum blancoi Planch. & Triana.

Suggested citation for referencing this book is:

Carig, Elizabeth T. Guidebook on Native Trees within the
Quirino Forest Landscape. Plaridel, Bulacan, St. Andrew Publishing House. 2020

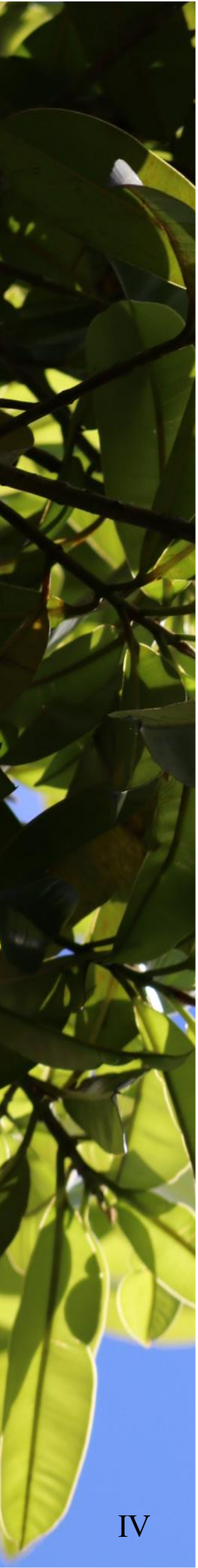
Content

Featured Tree Species



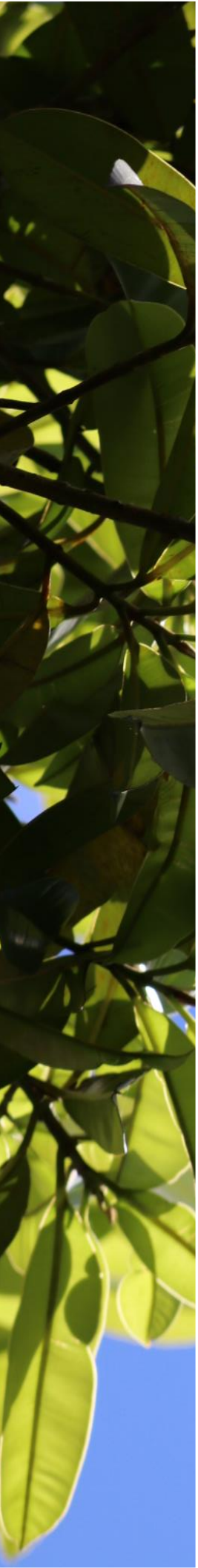
Acronym

BSF	Bachelor of Science in Forestry
CENRO	Community Environment and Natural Resources Office
COVID	Corona Virus Disease
DAO	Department Administrative Order
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOST-FPRDI	Department of Science and Technology - Forest Products Research and Development Institute.
IoT	Internet of Things
IUCN	International Union for the Conservation of Nature
JMC	Joint Memorandum Circular
LGU	Local Government Unit
MENRO	Municipal Environment and Natural Resources Office
QFLP	Quirino Forest Landscape Project
QSU	Quirino State University
SERD	Sustainable Environment for Rural Development Association Inc.



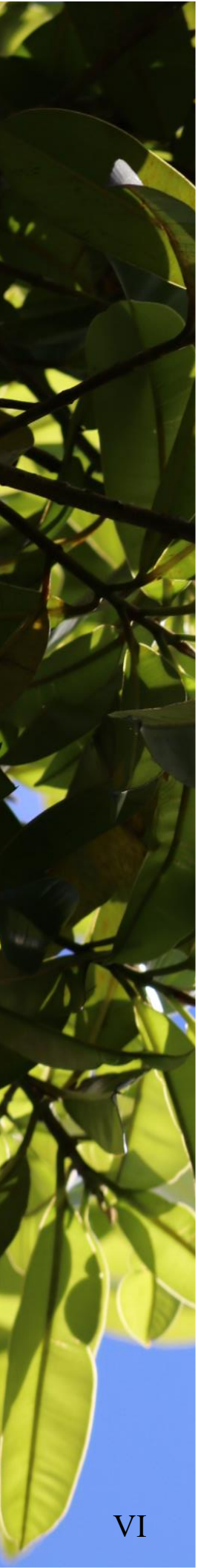
Glossary

Common name	Refers to the adopted name of a species as is widely used in the country; may be based on English or other foreign name, or Tagalog name, or when no local or vernacular name is available is derived from the meaning of its scientific name.
Conservation	Means preservation and sustainable utilization of wildlife, and/or maintenance, restoration and enhancement of the habitat;
Critically Endangered (CR)	When used in the context of the IUCN Red List, a taxon is classified as 'Critically Endangered' when there is an extremely high risk of extinction in the wild in the immediate future (IUCN, 2001). Refers to a species or subspecies facing extremely high risk of extinction in the wild in the immediate future. This shall include varieties, formae or other intraspecific categories (DAO No. 2007-01).
DAO No. 2007-01	A Department Administrative Order establishing the national list of threatened Philippine Plants and their categories, and the list of other wildlife species
Dipterocarp forest	Forest dominated by trees of the dipterocarp species, such as red lauan, tanguile, tiaong, white lauan, almon, bagtikan and mayapis of the Philippine mahogany group, apitong and the yakals.
Endangered (EN)	When used in the context of the IUCN Red List, a taxon is classified as 'Endangered' when there is very high risk of extinction in the wild in the immediate future (IUCN, 2001). Refers to a species or subspecies that is not critically endangered but whose survival in the wild is unlikely if the causal factors continue operating (DAO No. 2007-01).
Forest Canopy	A structurally complex and ecologically important subsystem of the forest. It is also defined as "the aggregate of all crowns in a stand of vegetation, which is the combination of all foliage, twigs, fine branches, epiphytes as well as the interstices (air) in a forest".
Forest lands	Include the public forest, the permanent forest or forest reserves, and forest reservations.
Forests	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
IUCN Red List of Threatened Species	The IUCN Red List of Threatened Species is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of quantitative criteria to evaluate the extinction risk of thousands of species. These criteria are relevant to most species and all regions of the world. With its strong scientific base, The IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.



Glossary

Lesser-used species	Also called Lesser-Known Species, are species that are commercially less accepted species left in the forest after a logging operation. These are species that are not being put to best advantage (although many commercial species are not being put to best advantage either).
Native trees	Trees that are living, growing, and reproducing naturally in a particular region. The focus in using native trees should be on trees that are native to the region and that are well-adapted to the specific site where they will be planted.
Premium Species	Refers to tree species, the wood of which has special characteristics such as strength, durability, beauty, scarcity or rarity, or is used for special purposes, and included in the list of such species embodied in DAO No. 78, Series of 1987 and other species that may hereafter be classified as such.
Secondary forest	A rainforest that has been disturbed in some way, naturally or unnaturally, created in a number of ways, from degraded forest recovering from selective logging, to areas cleared by slash-and-burn agriculture that have been reclaimed by forest. It is characterized (depending on its level of degradation) by a less developed canopy structure, smaller trees, and less diversity. Due to the lack of a full canopy, more light will reach the floor, supporting vigorous ground vegetation. "Jungle" is the term often applied to secondary forest with dense ground growth, but it is also applied to some tropical moist forests where seasonal variations permit thick ground growth.
Species	Refers to the smallest population which is permanently distinct and distinguishable from all others. It is a primary taxonomic unit;
Threatened Species	A general term to denote species or subspecies that is considered as critically endangered, endangered, vulnerable or other accepted categories of wildlife whose populations are at risk of extinction (DAO No. 2007-01).
Tropical Evergreen Lowland Forest	This forest type is characterized by little or no seasonal water shortage and rather uniform warm and humid conditions. It is structurally complex showing multiple layers along its vertical length. Scientists recognize 3 to 4 vegetative or structural layers each of which constitutes habitat for a tightly packed community of vertebrate and invertebrates
Undergrowth species	Low growth on the floor of a forest including seedlings and saplings, shrubs, and herbs
Vulnerable (VU)	When used in the context of the IUCN Red List, a taxon is classified as 'Vulnerable' when facing a high risk of extinction in the wild in the immediate future (IUCN, 2001). Refers to a species or subspecies that is not critically endangered nor endangered but is under threat from adverse factors throughout its range and is likely to move to the endangered category in the future (DAO No. 2007-01).
Watershed	An area of land that feeds water to a river, draining through the landscape into tributaries and main river channels. Also called catchments, drainage basins or river basins.
Wood	The hard-fibrous substance consisting basically of xylem that makes up the greater part of the stems, branches, and roots of trees or shrubs beneath the bark and is found to a limited extent in herbaceous plants



Message

Forests give us life. Not only does it give us essential products, like food and medicines, but forests also provide critical ecosystem services, like water catchment and air purification. Forests are also home to diverse plants and animals, including indigenous peoples. Without forests, we clearly won't survive. In the last decades, however, there has been a steady decline in the Philippine forests. From the original 27 million hectares of forest cover, it has decreased to 7.3 million hectares in 2015.

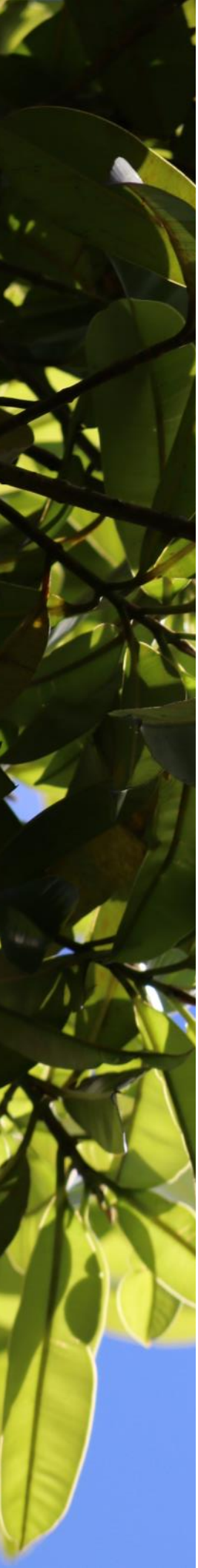
In 2002, under two bilateral agreements between the governments of the United States of America and the Philippines, the Forest Foundation Philippines, formerly known as Philippine Tropical Forest Conservation Foundation, was established to provide grants to organizations that empower the people to protect the forests. The Foundation currently focuses its support to the landscapes of Palawan, Samar and Leyte, Bukidnon and Misamis Oriental, and the backbone of Luzon, Sierra Madre.

Sierra Madre, the longest mountain range in the Philippines, runs from the provinces of Cagayan in the north to Quezon in the south. It has a land area of approximately 1.4 million hectares, which is embraced by ten provinces, including Quirino. Out of the 22% forest cover left in the country, 40% of which can be found in the Sierra Madre. It provides habitat for growth and development of diverse flora and fauna, which is among the most unique and richest on a per area basis. Its biological importance is not only due to its remaining intact forest, but also due to its high plant diversity, with more than 3,500 species recorded in the area. This represents about 45% of species recorded in the country. In fact, the highest number of endemic plant species is found in Sierra Madre, having 58% endemism. Clearly, there is a need to share the importance of these native species to more people so we can all work together to protect and conserve them.

Thankfully, we have this field guidebook on native trees in Quirino. We are grateful to the Sustainable Environment for Rural Development Association, Inc (SERD) for their hard work in producing this valuable resource material. Hopefully, through this book, we will be able to empower more people to become advocates of forest protection and conservation. We look forward to partnering with them in the future.

Thank you.

Atty. JOSE ANDRES A. CANIVEL
Executive Director
Forest Foundation Philippines



Message

Like other living things, trees have places of origin. Each species has found its niche in nature having adapted to the conditions set by the biotic and abiotic components of its original home and evolved to its present state. Native trees are vital in the survival of other organisms that co-evolved with them and in the preservation of biodiversity.

Quirino, nestled at the slopes of the Sierra Madre Range, is blessed with a variety of native tree species that need to be sustained and protected for their importance in the environmental and in various ecological services and economic activities in the area. They make up the vast forest cover which supplies drinking water to the people, provides irrigation system for agriculture, serves as a dwelling place for the endangered animal species indigenous to the province, and protects the area from flood and other extreme weather disturbances brought about by the climate change.

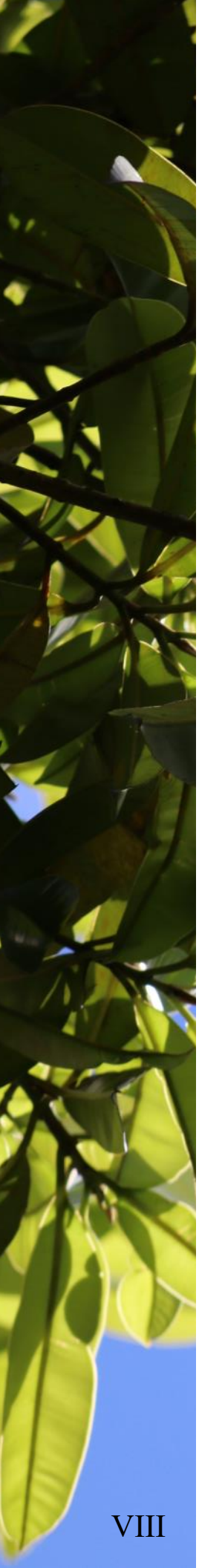
Concerns about native trees have gained new significance in peoples' environmental awareness and conservation initiatives. Because native trees are adapted to the locality's soils, temperature, amount of sunlight and rainfall, they can be propagated and managed with ease. Native trees are resistant to pests, diseases and can withstand weather conditions that the zone experiences such as typhoons and monsoons.

The growing population of Quirino should be more informed and educated about the province's natural resources such as the native trees and how these resources are preserved. Educating the people, young and old alike, will make them more aware about the environment and value the natural landscape for biodiversity and aesthetic beauty. This education can come from seeing trees in schools, arboretums, parks, wildlife areas and forested zones; understanding how these trees, the environment and living organisms including humans are interrelated; and appreciating how these trees provide clean air, filtered water, shade, food and soil that all residents depend on.

The book Field Guidebook on Native Trees within Quirino Forest Landscape documents important characteristics of the native trees such as habit of mature trees, fruit appearances, profile of mature/immature inflorescence, fruit clusters, leaf arrangement, timber classification, conservation status, distribution, other notable features, uses and even the vernacular name of each featured native tree. As an invaluable resource, the guidebook provides students informative and engaging experience about the indigenous trees. Populated with photos and interesting facts, it builds interest and fun among the users. Students' engagement with the guidebook will help them appreciate native trees and eventually become good stewards on the preservation of the environment, in general, and the native trees, in particular.

"Trees do not preach learning and precepts. They preach, undeterred by particulars, the ancient law of life (Herman Hesse)." Like the trees, let us be deeply rooted with our mission and let us aspire to grow and flourish. Let us disperse the seeds of knowledge and understanding so that others may live. For in doing so, we find life's meaning.

HERMENEGILDO F. SAMOY, JR., Ph.D.
University President



Acknowledgement

This publication is an effort to present the Philippine native trees found within the Quirino Forest Landscape Project area, covering the barangays of Don Mariano Perez, Ifugao Village and Baguio Village, municipality of Diffun; barangays of Calaocan, Eden, Dibibi and Dingasan, municipality of Cabarroguis; barangays Diodol, San Manuel and Victoria, municipality of Aglipay; and Jose Ancheta and Balligui, municipality of Maddela.

The completion of this book could not have been possible without the assistance and supervision of so many people. I would like to extend my gratitude and appreciation to the following PO Presidents and their respective members for their support and assistance during their field activities: Mr. Lito Bannagao (Don Mariano Perez), Alben C. Rodolfo (Baguio Village), Vicente B. Balajo (Ifugao Village), Cresencio G. Cadingan (Dibibi), Mauricio L. Ojascastro (Eden), Abel M. Decoran (Dingasan), Basanio C. Lobyo (Calaocan), Manuel T. Ngabit Jr. (San Manuel), Norma T. Mangili (Victoria), John M. Lub-e (Diodol), Arnold N. Pugong (Jose Ancheta), and Florencio P. Madiwo (Balligui).

To the different Punong Barangays, their Council members and their Barangay Tanods, for ensuring the security and safety of the Forest Assessment Team during their field activities;

To the MENRO personnel of Diffun, Cabarroguis, Aglipay and Maddela and personnel from CENROs Diffun and Nagtipunan for their active participation during the conduct of field inventory/assessment;

To the BS Forestry students of QSU, Princess, Ruth, Jaime and Ivy, who preferred to stay with SERD for their field practice and for actively participating during the field activities;

To the members of the Forest Assessment Team, Dr. Ryan P. Manuel, For. Romnick L. Pascua, For. Joel G. Carig, For. Franklin Dulnuan and For. Genita L. Pasion, for their knowledge, skills, patience and commitment in completing the field work;

To Dr. Dyanika Nolasco and Mr. Ronie Guillermo, for patiently editing the book;

To Dr. Dante M. Aquino, for patiently reviewing the book and giving his honest opinion to further improve it;

To Dr. Samuel O. Benigno and Dr. Hermenegildo F. Samoy Jr., the former and current University Presidents of Quirino State University, who are both plant enthusiasts, for their support to the project team starting from the conduct of field activities up to the book's publication;

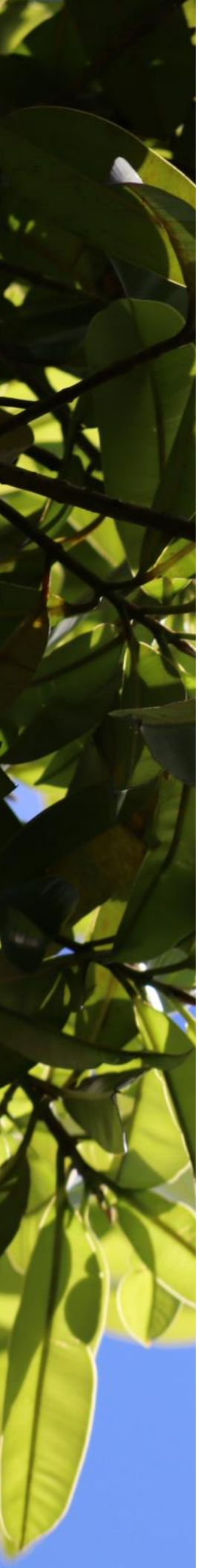
To Irene and Liwliwa, my photographers, my lay-out artists, my dendrologists and my researchers, for their patience of going back to the field to get photos of the different native tree species, especially during the flowering and fruiting stages; and for putting 'millennial' touch on this book, my endless gratitude to you both...

To the Forest Foundation Philippines for funding this endeavor;

And to all the persons whose names were not mentioned here; my heartfelt gratitude;

Above all, to the Almighty God, the giver of great knowledge and wisdom; for strengthening us to withstand all the difficulties along the way.

ELIZABETH T. CARIG
June 2019



Foreword

The Philippine forest is one among those recognized with the highest biodiversity in the world. However, there is a great unknown among the variety of biological materials that comprise this diversity. It is lamentable to note that only few experts deal on the nomenclature of the diverse plants and animals that comprise the forest ecosystem, hence a dearth on publications in these fields of study. There are a number of publications on birds with beautiful colored pictures but with limited circulation and patronized only by ornithologists. But for plants, although most were already identified, there is a dearth of references available on their detailed botanical descriptions. Even for trees - the large plants in the forest that are supposedly more readily identifiable and easily describable - there are no ready reference materials that are in circulation. The available publication at present is the *Lexicon of Philippines trees (revised)* (Rojo, Justo P. Los Baños: DOST-FPRDI, 1999) which is a "collation of information mostly from revision of plant groups in botanical/ taxonomic journals and books dealing with plants in the tropics particularly in the Malesian Region and surrounding areas". Just like the first edition (Salvosa Felipe M. *A foresty lexicon of Philippine trees*. College: FPRI, 1960) , the 1999 *Lexicon* presents complete and detailed taxonomic descriptions of each species included.

With the advent of technology, i.e. the internet of things (IOT) and in the social media, there are many accessible blogs and links online that provide information on many botanical species available on their databases (many on ornamental plants, some on trees). With good WiFi connection, some of these are instantly accessible online in many blogs, others as e-books in pdf formats usually available through officially registered libraries that may require registration or membership. Some are with commercial motives, others into business adverts. It is obviously noticeable that their websites are user-friendly and attractively dynamic that banner beautiful and colorful pictures of the plant species they feature. The eye-catching images cater to everybody of all walks of life, regardless of personal inclinations or field of interest. For the science-inclined women and men who are more interested into the technical details of plant description and characterization, much more is desired. More in-depth descriptions (botanical, taxonomic, systematics) are preferred by biologists, botanists, foresters, and plants enthusiasts. Being able to go back and review reference materials is usually done, so the availability of a readily accessible hardcopy (a book, for example) is much preferable. The nomenclature and identity of a plant species encountered may be ascertained if referred to and compared with the reference material.

It is in this regard that this book focused on native tree species will be very useful not only in the academe - for professors and students alike - but also to the field women and men involved in botany, forestry, or environmental science. Although quite limited in scope, geographical- and material- (50 species to be exact) wise, the details of known relevant features given for each species and the pertinent physical characters clearly shown in the colored pictures capture the pertinent characters of the tree that defines the doubtless identity of that particular species. It is worthy to mention that writing a book of this kind is a way of conserving the native tree species included in the book. With many of them under various categories of endangerment (critically endangered, vulnerable, threatened, etc.), these trees are permanently preserved in hardcopy (and electronic copy as well when the e-book form shall have been uploaded) readily available as published.

The author and her team deserve commendation in coming up with this book in a coffee table book format that is attractive and readable.

DANTE M. AQUINO
Retired Professor VI
ISU College of Forestry and Environmental Management

Part I. Introduction

The Author found her heart amongst the native trees which caused her to get interested in them. Why native trees? Because native trees are very important in the web of life. They are the foundation of our natural ecosystems (Lantican, 2015). They provide food and shelter to wildlife much better than introduce tree species. Native trees also adapt naturally to its local surrounding; thus, are more resilient than any other tree species (Tarriela, 2018). They also possess the natural ability to recover from damage caused by pests and diseases and even turbulent weather conditions (Lantican, 2015).

In recent decades, there had been a sharp decline in the population of native trees because of extractive and destructive human activities. Deforestation, replacement by invasive alien species, and establishment of monocrop plantations that only propagate commercially popular varieties of trees have been the major contributors to population drop (Green Convergence, 2012). Compounding the problem is the effect of rapid global climate change on plant phenology (Corlett & Lafrankie, 1998) which have been affecting the flowering and fruiting of many native tree species.

The province of Quirino is part of the Central Sierra Madre which is identified as one of the last frontier of natural forests in the country. The author has been working in the province for almost 18 years now and through those period, she has been an eyewitness of how forest cover declined and continue to decline due to expansion of agricultural production, especially corn farming, in forest land areas. With this, as a forester, the author has been involved in implementing extension projects geared towards sustainable forest management and in conducting researches which uncover information about the remaining forests in the province.

In 2016, the first leg of biodiversity inventories was conducted in the barangays of Eden and Dibibi in the municipality of Cabarroguis, the capital town of Quirino. The research activity focused on the assessment of the diversity and functions of secondary forests by undertaking physiognomy (structure) evaluation of the forests, biological diversity measurement of canopy trees and undergrowth species, and functional descriptions of the forests and the species. At that time, the author and her researcher assistants hoped that the output could be used as basis in crafting the management and protection plan for the two barangays.

Results of the inventory conducted revealed that the forests of Eden and Dibibi hold considerable advantage for both ecological and economic use. Many of the plants found thereat have ecological and other potentials. Diversity, structure and function of forests studied were in the early stages of self-restoration. The forests contain diversified assemblage of early successional and climax species. Moreover, the density of canopy and the undergrowth layers provide a fully stocked and diverse forest in the future. It was projected, therefore, that the forests in the said barangays can potentially become a major carbon sink of the province in the time ahead.

However, almost all of the sampled canopy and undergrowth species revealed very few individual trees. Only few species (e.g., Shorea contorta) are expected to "endure" individual extirpation because of their abundance in the two sites. It was concluded that in terms of land use, mix of economically viable and lesser-used/ lesser known species may lead to two "lose-lose" scenarios if not properly managed: people continuously replacing economically unimportant species with "money trees", like Gmelina and Mahogany, and people becoming more aggressive in harvesting economically important individuals to "edge out" competitors over land resources.

Pterocarpus indicus

In 2018, another rapid tree diversity and timber resources assessment was conducted in 12 barangays located in areas categorized as "forest landscape." These barangays include Ifugao Village, Baguio Village and Don Mariano Perez in the municipality of Diffun, barangays of Calaocan and Dingasan in the municipality of Cabarroguis, barangays of San Manuel, Victoria, and Diodol in the municipality of Aglipay, and barangays of Balligui and Jose Ancheta in the municipality of Maddela. These barangays are the project site of the Forest-Foundation funded project titled "Multi-stakeholders Collaboration for the Sustainable Management of Quirino Forest Landscape" (QFLP).

In this research undertaking, biological, ecological, economic, social and governance attributes of the area, particularly forest area and forest characteristics, biodiversity and conservation values, forest disturbances, forest area production, and protective functions and ecosystem services were assessed.

The study sites are generally termed as "Tropical Evergreen Lowland Forest" or "Dipterocarp Forest" following the classifications of Fernando et al (2004) and Tamesis (1948). Dominant species in low-lying open forests, like that of Eden and Dibibi, include Dungon (*Heritiera sylvatica*); Magabuyo and Banato (*Mallotus philippinensis*), were widespread in closed ridges while Binuang (*Octomeles sumatrana*) stands were found prevalent in upper slopes of Dingasan.

The highlight of the research results in terms of general diversity and conservation values of tree species revealed a total of 125 tree species within sampled plots. Diversity is very high (Shannon H'' = 3.90), and highly heterogeneous (Shannon E = 0.81). Dominance is shared by about 16% of total species (Simpson's Reciprocal Index = 20.03). Given the tree assemblage within the plots, possible maximum diversity in surrounding areas exceeds normal Shannon-Weiner Index values, implying very complex tree diversity (H'_{max} = 4.83).

The forest assessment team recorded that three out of five most frequent species in the sampled sites are dipterocarps, to include White lauan (*Shorea contorta*), Tanguile (*Shorea polysperma*), and Mayapis (*Shorea palosapis*) while the other two most abundant species are Narra (*Pterocarpus indicus*), and Magabuyo (*Celtis philippinensis*). These are all considered "climax" trees since mature individuals of such dictate the canopy, structure, recruitment, and general functioning of the forest.

Other notable trees sighted and reported by locales include Red Lauan (*Shorea negrosensis*), Hagakhak (*Dipterocarpus validus*), Binuang (*Octomeles sumatrana*), Balobo (*Diplodiscus paniculatus*), Nato (*Palaquium luzoniense*), Tuai (*Bischofia javanica*), Lamio (*Dracontomelon edule*) and Mountain Tapinag (*Sterculia montana*).

In terms of conservation values, as per International Union for the Conservation of Nature (IUCN) Red List and DENR Administrative Order 2007-01, approximately a third (33.60%) of sampled canopy trees (43 species total) require conservation effort. Species listed as Critically Endangered (Red List) are: Guijo (*Shorea guiso*), White and Red Lauans (*Shorea contorta, S. negrosensis*) and Narra (*Pterocarpus indicus*). In consideration of endemism and level of endangerment, White Lauan (*Shorea contorta*) is the most critical species.

Using Department Administrative Order (DAO) 2007-01, other critically endangered species encountered within the forest landscape includes Kamagong (*Diospyros blancoi*), Malinoag (*D. brideliifolia*) and Dalingdingan (*Hopea foxworthyi*); vulnerable species include Dao (*Dracontomelon dao)*, Molave (*Vitex parviflora)*, Tanguile (*Shorea polysperma*), Balakat-Gubat (*Balakata luzonica*),

Pterocarpus indicus

White Lauan (*Shorea contorta*), Kalingag (*Cinnamomum mercadoi*), Red Nato (*Palaquium luzoniense*) and Malak-Malak (*Palaquium philippense*); and other threatened species include Bitongol (*Flacourtia rukam*), and Malakatmon (*Tetracera scandens*).

With all facts gathered regarding the state of remaining forests within the "forest landscape" project area, advocacy and other activities leading to the development, management and protection of remaining natural forests were done from 2016 to present. Orientation on various environmental laws to the members of the different barangay local government units were undertaken and the response of the different BLGUs was overwhelming. Technical assistance in crafting and enacting barangay ordinances declaring remaining forests as "community watersheds" were accomplished. The identification of community watershed for each of the barangays is important since these areas "sources of water supply for specific local communities" (DENR-DILG JMC NO. 98-01). An aggregate area of 6,916.24 hectares was declared as community watersheds (digitized declared community watershed in the twelve barangays shown in Figure 1A, 1B, 1C and 1D) through barangay ordinances. These barangay ordinances provide guidance to the BLGUs on what are the allowable and prohibited acts inside the declared community watersheds including penalties for activities that may be committed thereat.

Since a lot of the forest trees identified during the conduct of inventory are native trees, local leaders and BLGU officials were consulted as to their willingness to identify and declare premium species of native trees as "mother trees". "Mother trees" will be the sources of seeds and seedlings for future reforestation/rehabilitation activities of concerned entities in the area and in other parts of the province. Once identified as mother trees, these will be marked and geotagged as well as protected from any form of cutting or harvesting. The acceptance was tremendous that eventually led to the identification, marking and geotagging of 305 native mother trees within the twelve barangays. Signages were prepared and installed in each of the identified mother trees to prevent cutting. Most of these mother trees are featured in this book. A map showing the relative location of these mother trees is shown in Figure 2A and Figure 2B.

Aside from joint undertaking with local communities, a 24-hectare arboretum located in Maria Clara, Diffun was established and maintained. This 24-hectare arboretum is found within a 30-hectare co-management area of Quirino State University (QSU) with DENR. Assorted native trees comprising successional and climax species were planted in the area with strong involvement of students. This arboretum is already utilized as forest laboratory of BS Forestry students of the University.

From just being an eyewitness of forest cover decline and being involved in conducting inventory and restoring forest cover and various undertakings completed in between, the author is coming up with this **Field Guidebook on Native Trees found within the Quirino Forest Landscape**. This book is an offshoot of the research studies and extension projects conducted by the author and her research team. Originally, the book is intended only to showcase tree diversity within selected areas of Quirino, but eventually expanded to be used as basis for future planning and policy formulation by LGU concerned and to serve as reference book for BS Forestry students especially those taking Dendrology. Copyright and book number were obtained from the National Library. Copies of this book shall eventually be distributed to the different local government units in the province, as well as, in the library of the university to serve as reference.

Pterocarpus indicus

The difficult task of going back to the field and finding the different native trees in their natural habitat within the almost 7,000 hectares declared community watershed was started late 2018. It was a long process and tedious work not only in getting photos but also monitoring their flowering and fruiting stage, and in researching crucial information about these trees. Despite the hardship and difficulties, coming up with this book is all worth it.

The publication of this book is timely considering the current situation of learning as a result of COVID-19 pandemic. With restrictions on face-to-face learning and group activities, this book will generally help BSF students become familiar with native trees in the province, as well as, relevant tree information such as: habit of mature trees, fruit appearances, profile of mature/immature inflorescence, fruit clusters, phyllotaxy or leaf arrangement, timber classification, conservation status, distribution, notable features, uses and even the vernacular name of each featured native tree.

The author hopes that students will be able to appreciate native trees and their roles in ecological balance and would also become advocates for its sustainable management and protection.

Pterocarpus indicus

Figure 1A. Map of Declared Community Watersheds in the municipality of Diffun

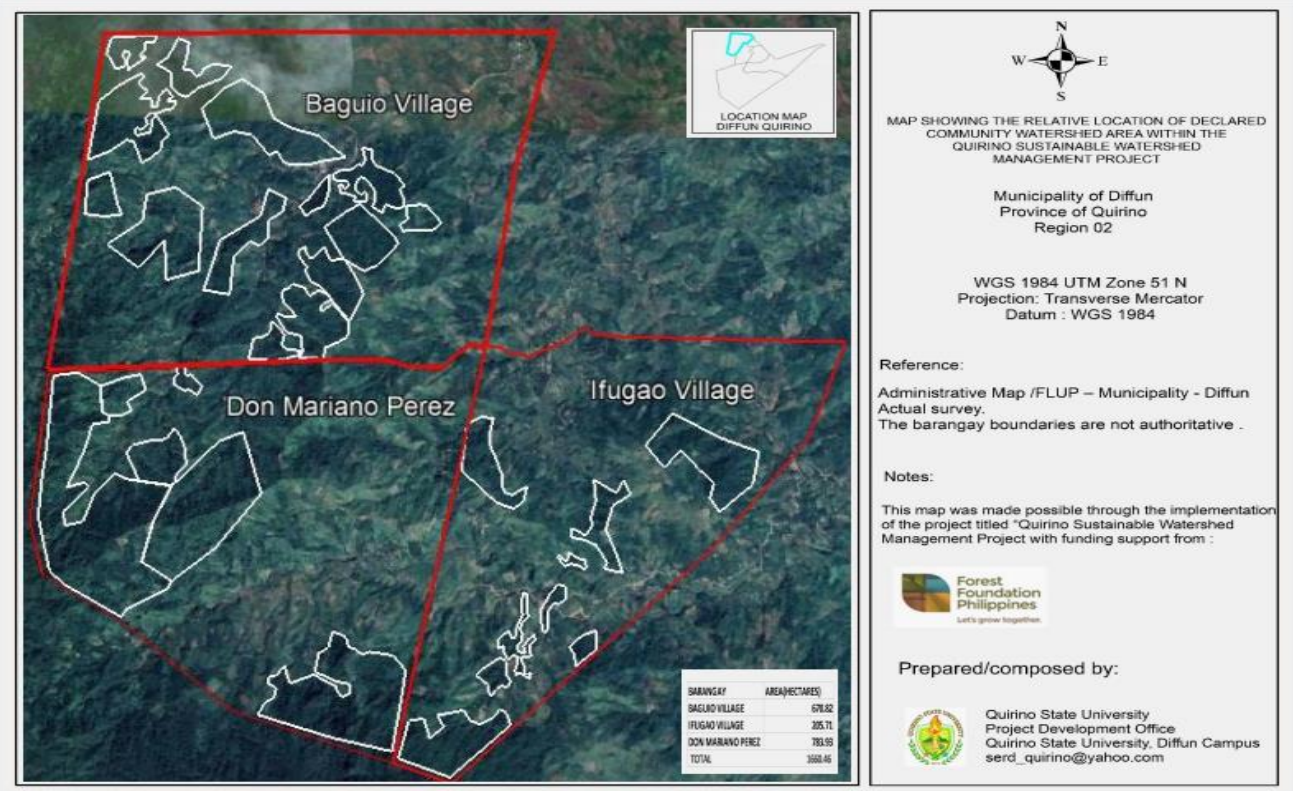


Figure 1B. Map of Declared Community Watersheds in the municipality of Cabarroguis

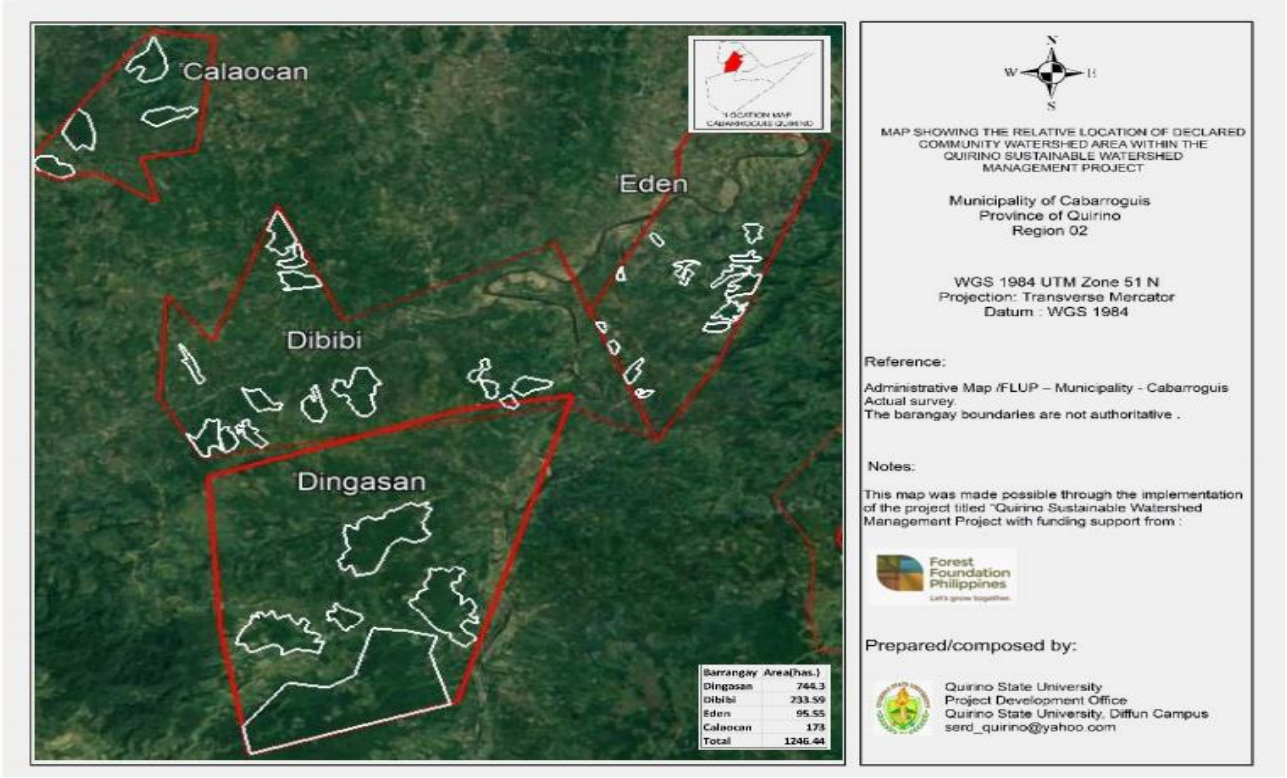


Figure 1C. Map of Declared Community Watersheds in the municipality of Aglipay

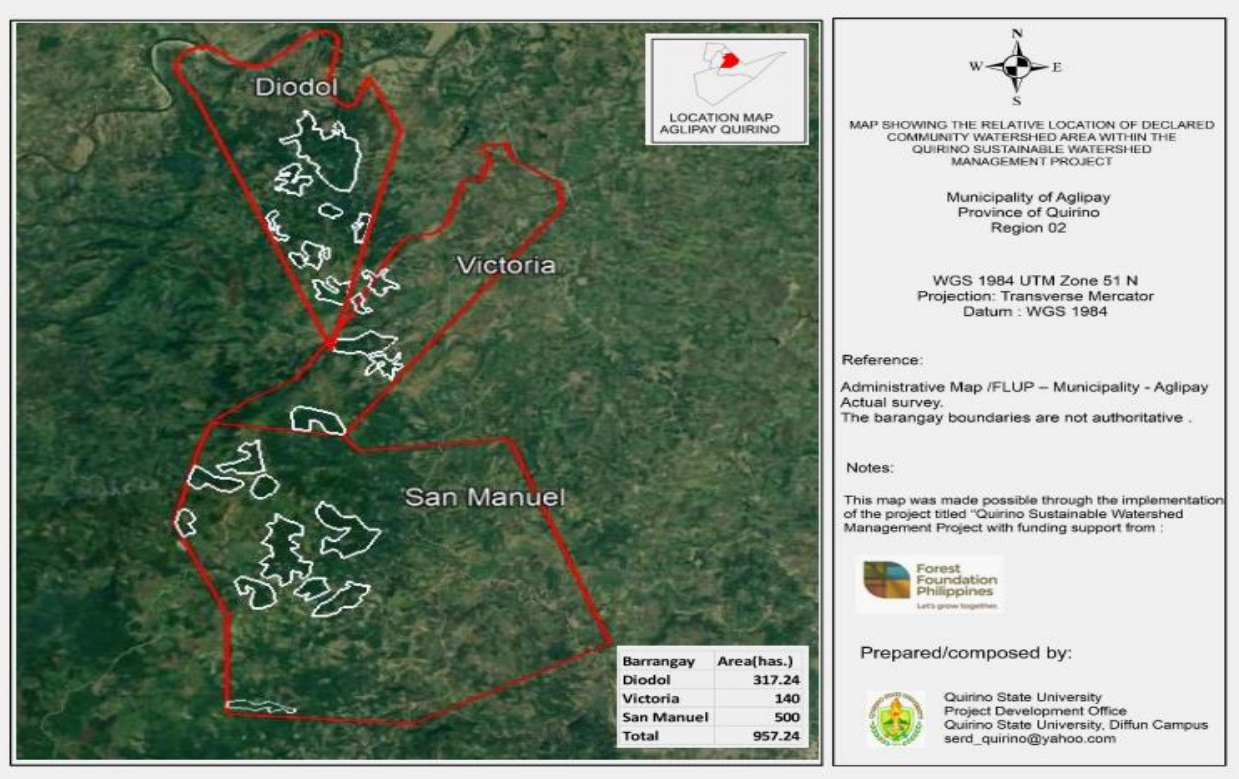
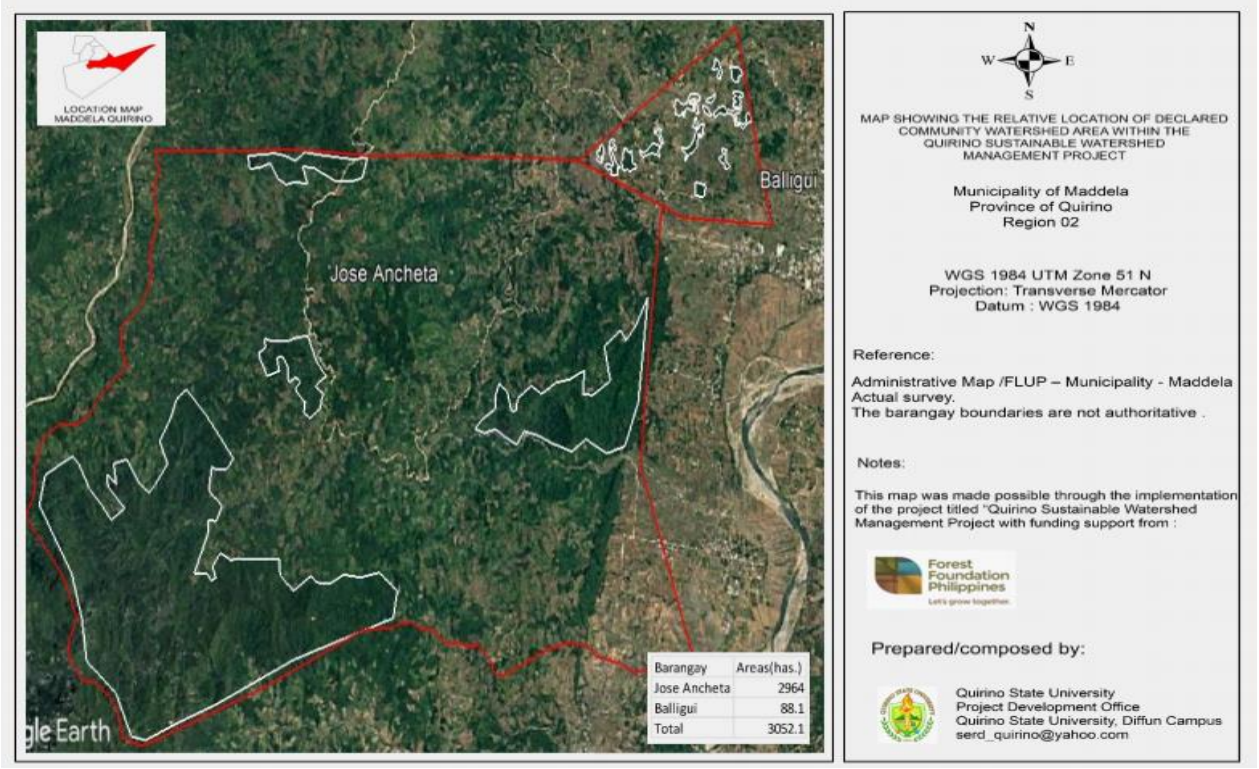


Figure 1D. Map of Declared Community Watersheds in the municipality of Maddela



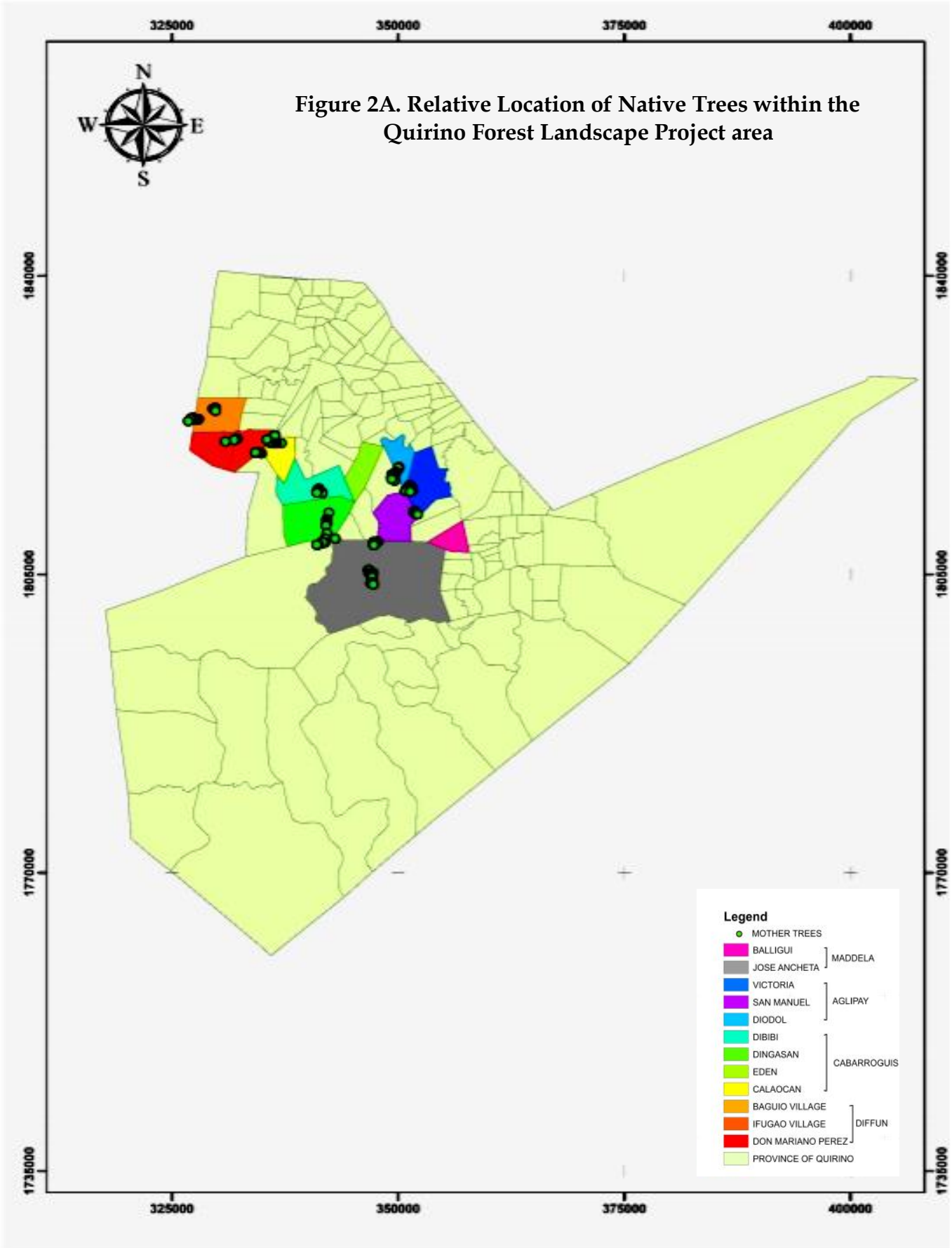
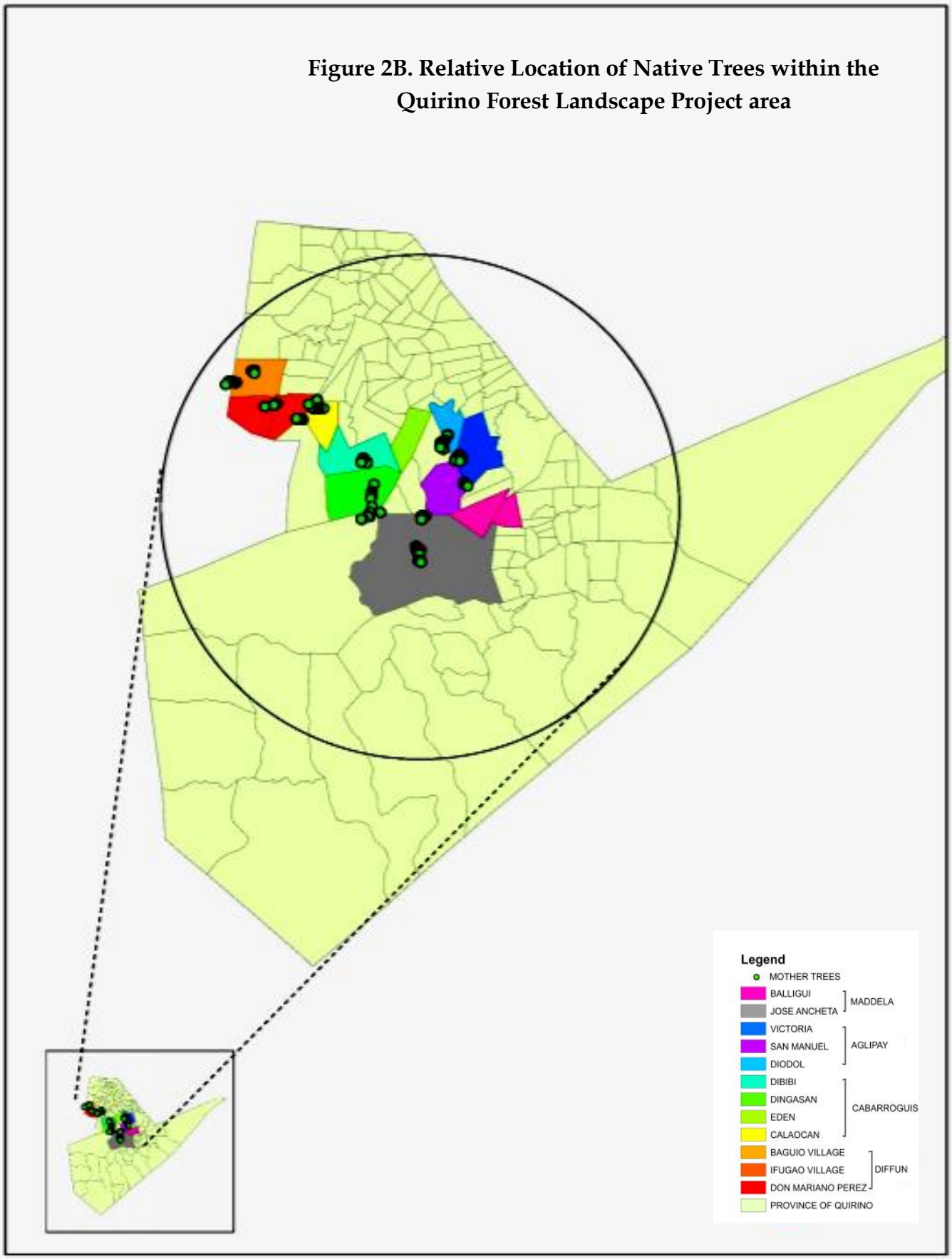


Figure 2A. Relative Location of Native Trees within the Quirino Forest Landscape Project area

Figure 2B. Relative Location of Native Trees within the Quirino Forest Landscape Project area



Dillenia philippinensis Rolfe

Part II

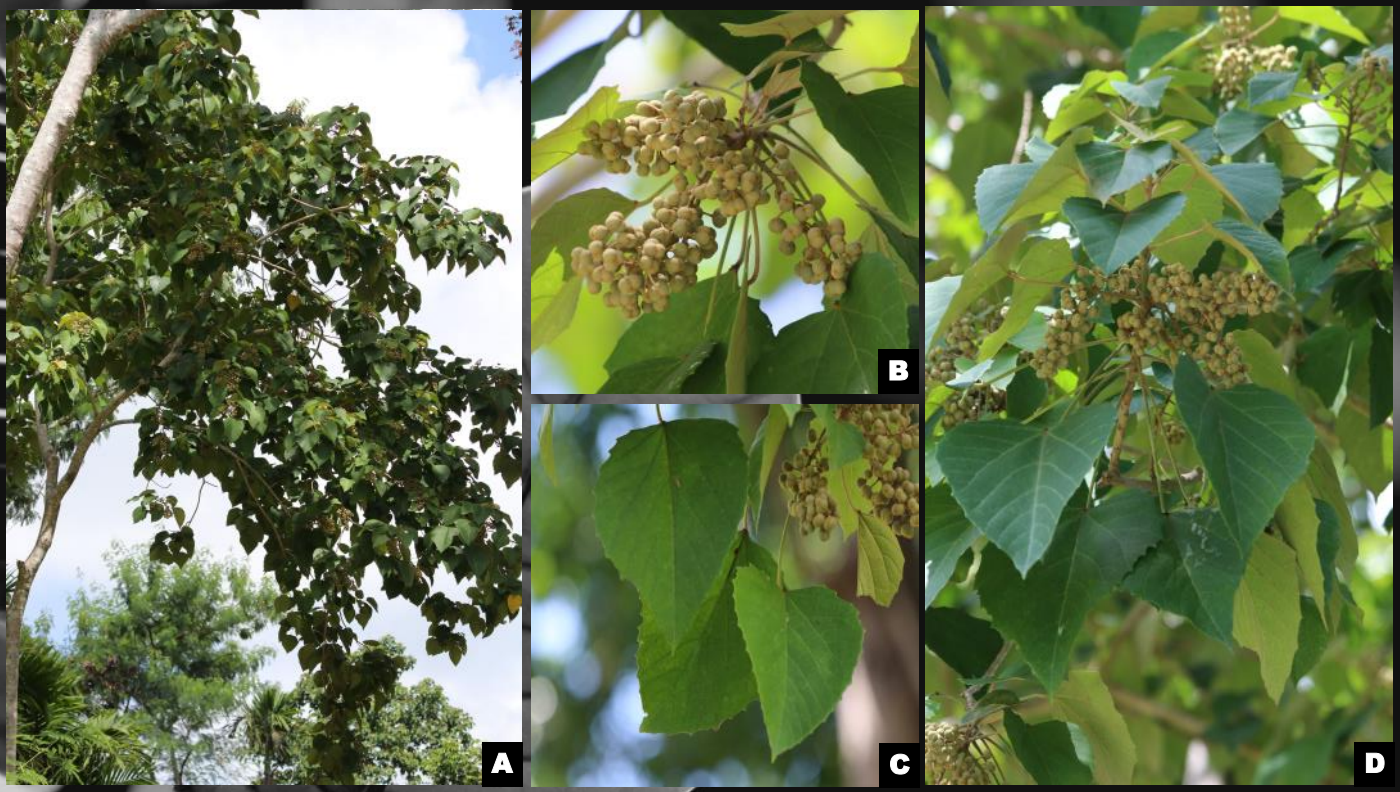
NATIVE TREES

Alim

Melanolepis multiglandulosa W (Reinw. Ex Blume) Rchb.f. & Zoll.

Alim

Trema orientalis (Reinw. Ex Blume) Rchb.f. & Zoll ***Euphorbiaceae*** (Spurge family)



A. Habit of mature tree. **B**. Fruit. **C**. **Profile of leaf. D.** Phyllotaxy or leaf arrangement.

Year first Described	1857	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Alok (Bicol, Bisaya); Alom, Alok (Pangasinan, Zambales); Alum (Ayangan); Bihnung (Iloko)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed

Notable features: **Evergreen shrub or a tree** that grows to 4-10 m high; **Bark** is smooth to shallowly fissured with minutely lenticels and flaky; **Latex** is milky and sticky; **Leaves** are large, orbicular-ovate, with a heart-shaped base, pointed at the tip, and often deeply three- to five-lobed, with coarsely toothed margins; **Flowers** are greenish yellow; **Fruit** is a capsule, about millimeters each way, smooth and consisting of 2 or 3 parts.

Uses: **Wood** (light and durable) for shoes and firewood; **Bark** for cough; Crushed, dried leaves, mixed with cold water, are drunk to treat constipation, chest complaints and tuberculosis.

Where to find: Common in thickets and secondary forests at low and medium altitudes.

Almaciga

Agathis philippinensis Warb.

Almaciga

Agathis philippinensis Warb. — *Araucariaceae* (Auracaria family)

A. Leaf arrangement.

Year first Described	1900	**Timber Classification**	Premium species
Vernacular Name/s	Philippine Agathi (English); Manila copal and Kauri (Trade name); Almaciga (General)	**Conservation Status**	CR EN VU CD NT LC DD Endangered (IUCN 2.3)
Distribution	Baguio Village, Don Mariano Perez, Jose Ancheta	**Propagation**	Seed, cuttings

Notable features: **A large evergreen tree** with pyramidal crown and whorled branches (50-60 m tall); **Bark** light gray to reddish exuding resin, smooth; **Leaves** are entire and leathery; simple, opposite or nearly so oblong-lanceolate to linear-lanceolate and obtuse.

Uses: **Wood** (high quality timber) for boat-building, decorative plywood, paneling and furniture; **Resin** for varnishes, lacquer, soap, paint, printing inks, linoleum, floor wax, plastic, water proofing material and the like; **Almaciga resin** traded as Manila copal.

Where to find: In primary forests, at medium and higher altitudes, 200 to 2000 meters above sea level.

Amamali

Leea aculeata Blume ex Spreng

Amamali

Leea aculeata Blume ex Spreng

Vitaceae (Grape family)

A. Profile of immature inflorescence. **B.** Fruit cluster. **C.** Leaf arrangement.

Year first Described	1824	**Timber Classification**	n/a
Vernacular Name/s	Mali-mali (Pampanga, Tagalog); Anga-ang (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Data Deficient
Distribution	Evenly distributed throughout the landscape	**Propagation**	Seed, cuttings, and air layering

Notable features: **Spiny shrub or small tree** (8-10 m tall); **Leaves** are smooth and trifoliate or pinnate com pound, prominently toothed along all margins except the base; **Trunk** and main branches are spiny; **Flowers** are white-yellow-pink, and borne on corymb; **Fruit** is red, somewhat rounded, about 1 cm in diameter.

Uses: Leaves are reported to be used for purifying blood.

Where to find: Common in thickets and second-growth forests, especially along streams; at low and medium elevations, sometimes ascending to 1,300 meters.

Amugis

Koordersiodendron pinnatum (Blanco) Merr.

Amugis

Koordersiodendron pinnatum (Blanco) Merr. *Anacardiaceae* (Cashew family)

A. Habit of mature tree. **B.** Phyllotaxy or leaf arrangement.

Year first Described	1903	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Taligaan (Ilocos Norte), Bankasi (Ilocano), Mugis, Ambugis (Bulacan), Tirong, Oris, Urisan (Cagayan)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (DENR DAO 2007-01)
Distribution	Jose Ancheta, Don Mariano Perez, Ifugao Village, Calaocan	**Propagation**	Seed

Notable features: **A large evergreen tree** (25-50 m in height); **Leaves** are spirally arranged, crowded at the ends of twigs, with six to 16 pairs of leaflets; **Leaflets** are oblong, with an equilateral obtuse base and acuminate apex; **Bark** is dark brown or black, shallowly or deeply fissured; **Flowers** are white or yellowish green.

Uses: **Wood** (light and durable) for flooring, furniture, general house construction;
Exude gums (local medicine).

Where to find: In undisturbed forests up to 800-meter altitude, but usually below 500 meters. In secondary forests, it is usually present as a pre-disturbance remnant. It is widely distributed throughout the Philippines.

Anabiong

Trema orientalis (L.) Blume

Anabiong

Trema orientalis (L.) Blume

Cannabaceae (Hemp family)

A. Habit of mature tree. **B.** Profile of immature inflorescence. **C.** Phyllotaxy or leaf arrangement.

Year first Described	1856	**Timber Classification**	Pulpwood and Matchwood Species
Vernacular Name/s	Gunpowder tree (English); Anardung (Mt. Province); Anadong(Pangasinan); Analdong (Tuwali); Anachong (Ayangan); Pangarandungen (Iloko)	**Conservation Status**	CR EN VU CD NT **LC** DD Least Concern (IUCN 2.3)
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed, Stump cuttings

Notable features: **Small to mid-sized** evergreen **tree** (5-18 m tall); **Bark** light gray to brown, smooth, finely-fissured and thin when fully mature; **Leaf** hairy, ashy green; alternately arranged in two rows, narrowly ovate and with finely serrated margin.

Uses: **Wood** (light and durable) for charcoal, pulp and paper, fireworks;
Bark for dyeing and roughening fishing lines;
Young shoots and Fruits for consumption.

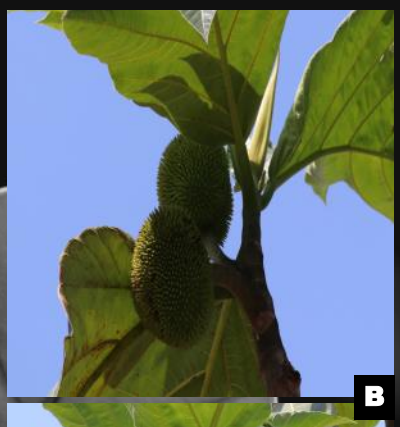
Where to find: In clearings and second growth low– to mid-montane forests/areas

Antipolo

Leea aculeata (Elmer) Merr.

Antipolo

Artocarpus blancoi (Elmer) Merr. — *Moraceae* (Breadfruit family)



A. Profile of young leaf. **B. Immature** fruit. **C.** Habit of mature tree.

Year first Described	1923	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Pakak (Batanes, Cagayan, Pangasinan); Pakak-bakia, Tuyop (Zambales); Kamansi (Bataan, Iloilo); Razara (Palawan); Pa-akh (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (IUCN 2013)
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed

Notable features: **A large evergreen tree**, growing up to 30 m tall; **Leaves** are simple, spirally arranged, with one to three pairs of lobes; **Hairy petioles** are about 8 centimeters long; **Leaf characteristics** are similar to *Artocarpus altilis* (Rimas).

Uses: **Wood** (soft) for light construction, pulp and paper;
Bark for cordage (carabao yoke); **Fruit** for cooking (vegetable)

Where to find: In dry low– to mid-elevation thickets and forests, at low and medium altitudes.

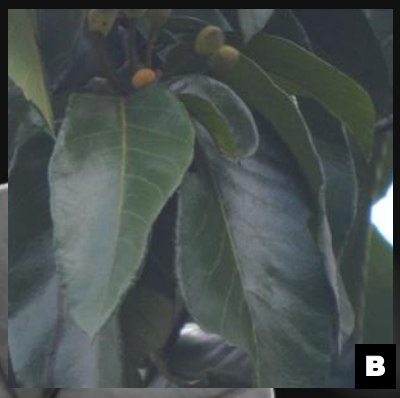
Anubing

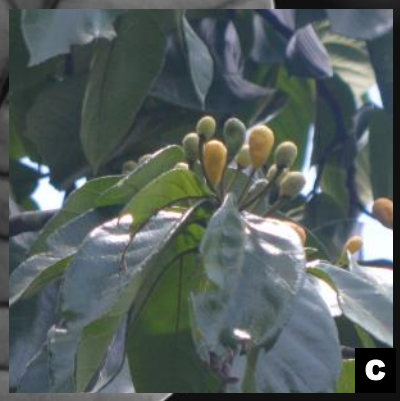
Artocarpus ovatus Blanco

Anubing

Artocarpus ovatus Blanco

Moraceae (Breadfruit family)





A. Habit of mature tree. **B.** Profile of leaf. **C.** Fruit. **D.** Phyllotaxy or leaf arrangement .

Year first Described	1837	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Kubi (Tayabas, Mindoro, Sorsogaon, Samar , Cagayan); Tagap (Baler); Tumolubo (Isabela); Bili (Tuwali); Tufah (Ayangan)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Jose Ancheta, Don Mariano Perez, Caloocan, Dibibi	**Propagation**	Seed

Notable features **A deciduous tree** reaching a height of 30 meters and a diameter of about 100 centimeters; **Leaves** are oblong or subelliptic, hairy, pointed or slightly heart-shaped at the base; **Fruit** is about 10 centimeters long, irregularly rounded with the anthocarp extending into brownish, hairy appendages or tails, green when young, yellow to brown into maturity; **Seeds** are ellipsoid, and embedded in whitish, more or less gummy meat.

Uses **Wood** is a source of keledang timber, which is traded; houses posts and poles; **Latex** with potential for use as a chewing gum base is obtained from the tree.

Where to find Lowland forests and thickets, at elevation up to 750 m.

Bagalunga

Melia dubia Cav.

Bagalunga

Melia dubia Cav.

Meliaceae (Mahogany family)

A. Habit of mature tree. **B.** Profile of juvenile leaf. **C.** Fruit. **D.** Phyllotaxy or leaf arrangement.

Year first Described	1789	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Agalunga (Central Visayas); Balanggago, gango, lantana, mali-ba, sili-sili (Tagalog)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed

Notable features **A large deciduous tree** reaching 15 m tall; **Leaves** are compound with toothed leaflets; **Bark** is grey, longitudinally fissured and flaky; **Flowers** are small, greenish-yellow in much branched inflorcences; **Fruits** are green, ellipsoidal with a single seed covered by hard portion (as in a mango fruit) and surrounded by fleshy pulp outside.

Uses **Wood** for cigar boxes, ceiling planks, building purposes, agricultural implements, pencils, match boxes, and splints; **Bark** to cure skin diseases and open wounds; **Leaves**, when dried and burned, drive away mosquitoes.

Where to find Commonly found in the hills at elevations ranging from 600 – 1800m.

Bahai

Ormosia calavensis Blanco

Bahai

Ormosia calavensis Blanco

Fabaceae (Legume family)

A. Mature fruit. **B.** Leaf arrangement.

Year first Described	1845 (Flora de Filipinas)	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Bangate, tindalog-aso, horse-eye beans; Magallayaw (Ifugao)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Jose Ancheta	**Propagation**	Seed

Notable features **A small sub-canopy, evergreen tree** (20 m tall); **Bark** is gray or dark brown and rough; It has no sap and the terminal buds are not enclosed by leaves; **Fruits** are infrutescence arranged on branched axis, brown to black color, not spiny, non-fleshy, simple, dehiscent, legume.

Uses **Wood** for furniture, cabinet work, interior finish, and general construction.; **Leaves** for stomach aches; The brightly colored seeds are used for making necklaces.

Where to find This tree is found scattered in dipterocarp forests, particularly in forests at low and medium altitudes.

Balinghasai

Buchanania arborescens (Blume) Blume

Balinghasai

Buchanania arborescens (Blume) Blume — *Anacardiaceae* (Cashew family)

A. Habit of mature tree. **B**. Profile of juvenile leaf. **C**. Immature inflorescence. **D**. Phyllotaxy or leaf arrangement .

Year first Described	1850	**Timber Classification**	Furniture, Construction Hardwood
Vernacular Name/s	Little Gooseberry, Sparrow's Mango (English, India); mango-gong, marangguub, salingagon (Palawan); Mampat (Malay)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Calaocan	**Propagation**	Seed

Notable features — **Evergreen tree** up to 35 m tall; **Leaves** are spirally alternately arranged and tend to be clustered towards the ends of the branches, smooth, leathery, elongated oblong, and simple; **Flowers** are very small with cream to yellowish white color; **Fruits** are edible, globular, small (1 cm long) and reddish to purple-black in color.

Uses — **Wood** for light constructions, interior works, veneer, plywood, furnitures and novelties; **Tannin from Bark** is used for toughening fishing nets.

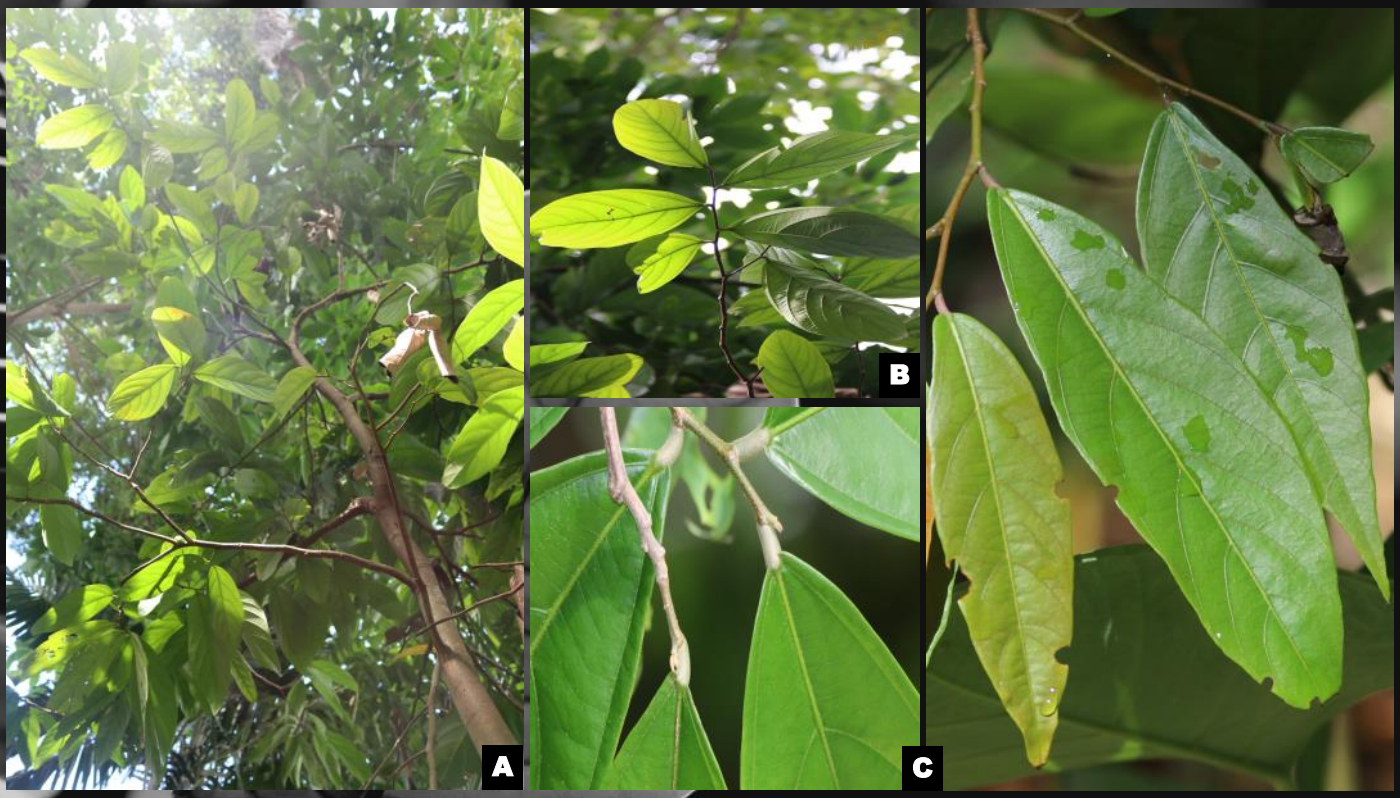
Where to find — It grows in lowland secondary forests, along riverbanks, near beaches, peat swamps, and on hills, up to 500 m altitude.

Balobo

Diplodiscus paniculatus Turcz.

Balobo

Diplodiscus paniculatus Turcz. — *Malvaceae* (Mallow family)



A. Habit of mature tree. **B.** Leaf arrangement. **C.** Profile of leaf.

Year first Described	1858	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Burubu (Cagayan); Bagobo (Ilocos Norte); Manaring (Isabela); Balogo (Pangasinan); Maramani (Iloko); Pamulinaw (Ifugao)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable A1cd (IUCN 2.3)
Distribution	Jose Ancheta, Baguio Village, Dibibi, Dingasan, Don Mariano Perez, Victoria, San Manuel	**Propagation**	Seed, cleft grafting, and marcotting

Notable features: **A medium-sized tree** (20 m tall) with an irregular bole and buttressed base; **Bark** is rough, dirty brown, flaky-scaly, flaking and at times sloughing into small irregular shaped sheets, leaving flat scars on the surface of the bole; **Leaves** are simple which are alternate, elliptic or oblong elliptic, glossy above with obtuse to rounded, or slightly inequilaterally base.

Uses: **Wood** (light and durable) for light construction and household utensils; **Bark** for making ropes; **Seeds** are edible which can be roasted or boiled.

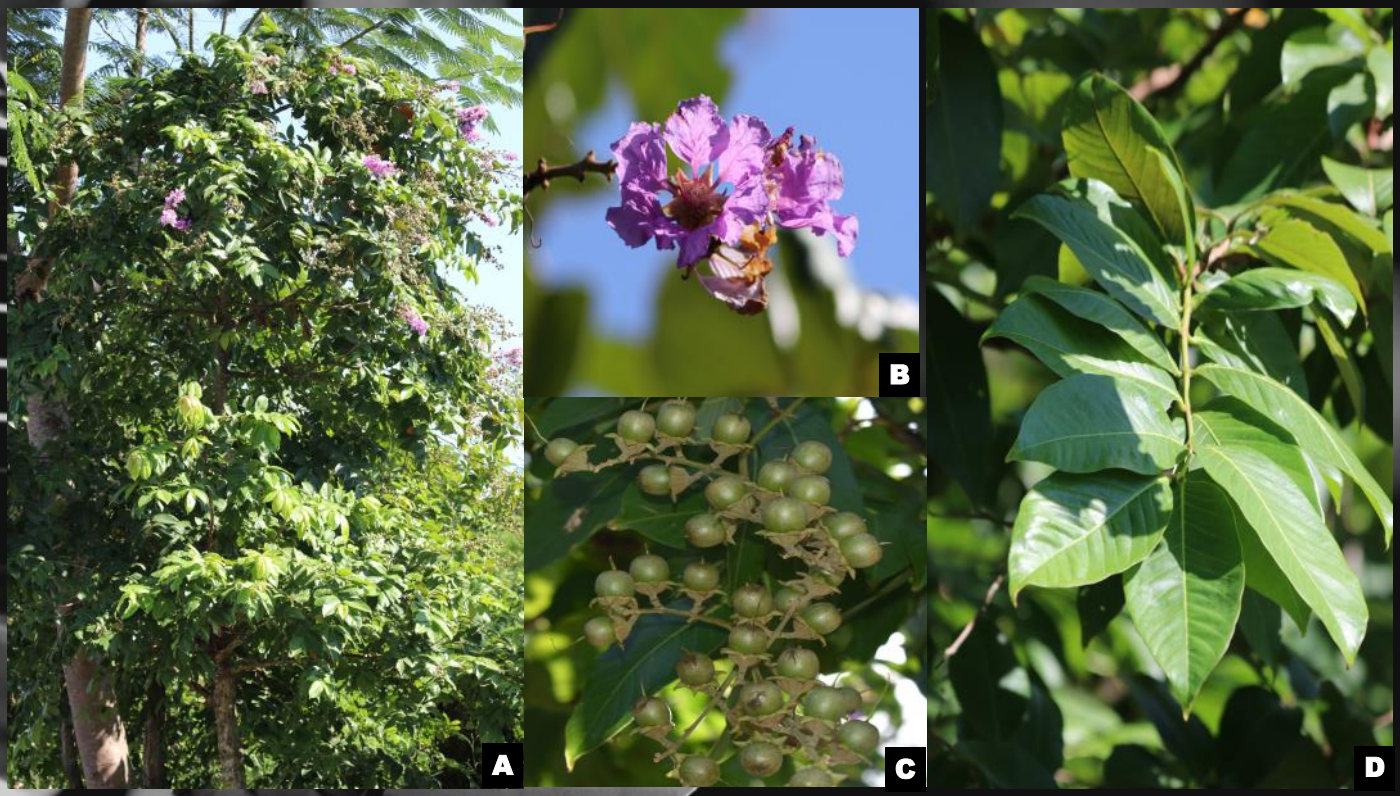
Where to find: The species can be found in primary and secondary forests at low and medium altitude often on flat lands, seldom on sloping areas.

Banaba

Lagerstroemia speciosa (L) Pers.

Banaba

Lagerstroemia speciosa (L) Pers. — *Lythraceae* (Loosestrife family)



A. Habit of mature tree. **B.** Flower. **C.** Fruit. **D.** Phyllotaxy or leaf arrangement.

Year first Described	1806	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Queen of flower (English); Nabulong, Tabangau (Cagayan); Aropag, Makabolo (Pangasinan); Mitla (Tarlac)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the province.	**Propagation**	Seed, Stump cuttings

Notable features: **A deciduous tropical flowering tree** (5-20 m tall); **Bark** is smooth, gray to cream-colored, and peels off in irregular flakes; **Leaves** are smooth, large, spatulate, oblong to elliptic-ovate; **Flowers** are 6-parted, purplish lilac or mauve-pink, rarely pink.

Uses: **Wood** (hard and durable) for paneling, paddles, agricultural tools and handicraft;
Bark for treating diarrhoea and abdominal pain;
Leaves and dried fruits traditionally made into herbal tea (Banaba tea).

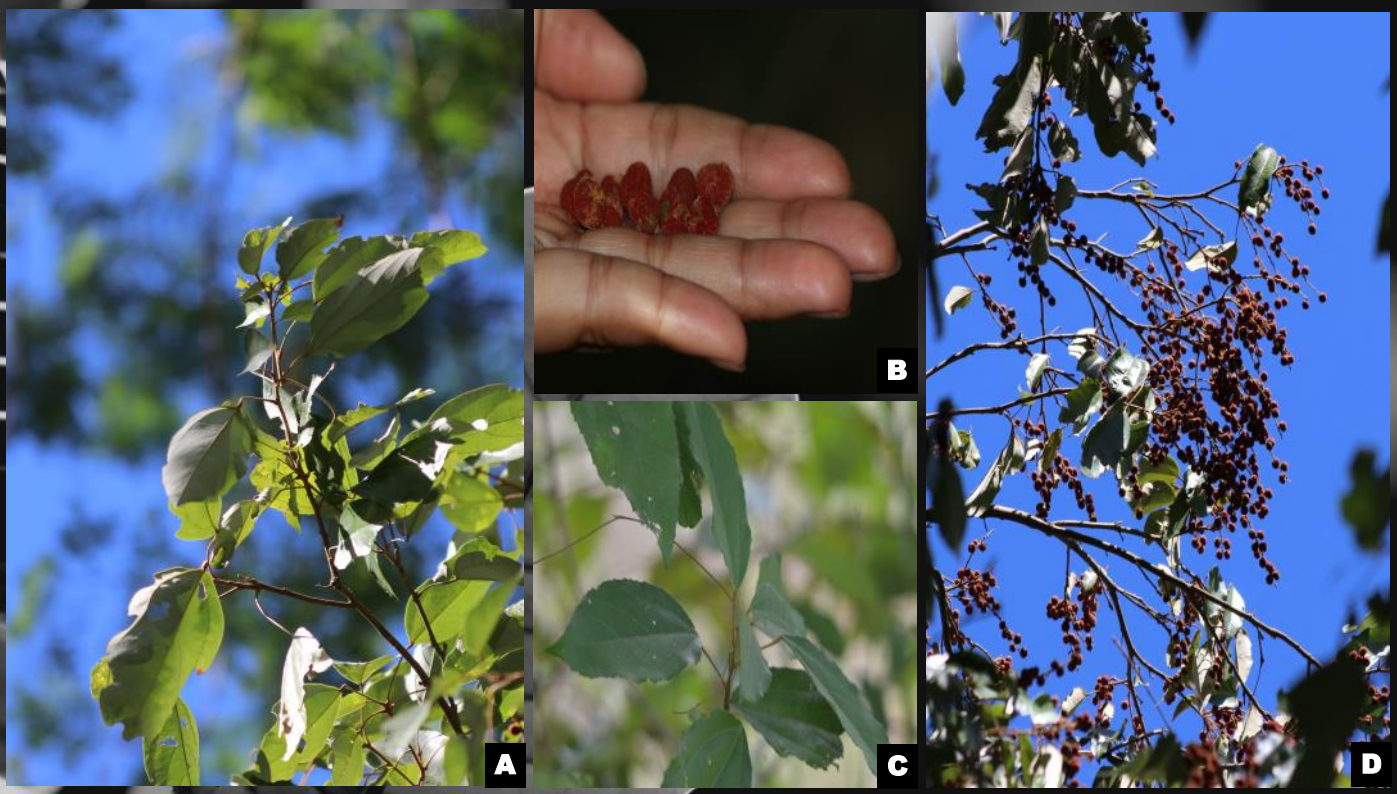
Where to find: Relatively open sites like secondary or disturbed forests, grassland, and especially along rivers.

Banato

Mallotus philippensis (Lam.) Mull.Arg.

Banato

Mallotus philippensis (Lam.) Mull. Arg. — *Euphorbiaceae* (Spurge family)



A. Phyllotaxy or leaf arrangement. **B.** Fruit. **C.** Profile of leaf. **D.** Fruit cluster.

Year first Described	1865	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Buas (Ilokano); kamala (English); Darandang (Tagalog)	**Conservation Status**	CR EN VU CD NT LC DD Abundant
Distribution	Evenly distributed throughout the province.	**Propagation**	Seed

Notable features — **Evergreen tree** growing up to 4-10 m, with the branchlets, young leaves and inflorescence covered with brown hairs; **Leaves** are alternate, oblong-ovate, with a pointed tip and rounded base with toothed or entire margins; **Fruit** is somewhat spherical, covered with red or crimson powder.

Uses — **Kamala powder**, obtained from the skins of the fruits, is used as a preservative for vegetable oils and dairy products; **Fruits** contain a pigment that is the source of kamala dye, which is used for dyeing wool and silk bright orange; **Wood** for rafters, tool handles, matchboxes, and house-posts.

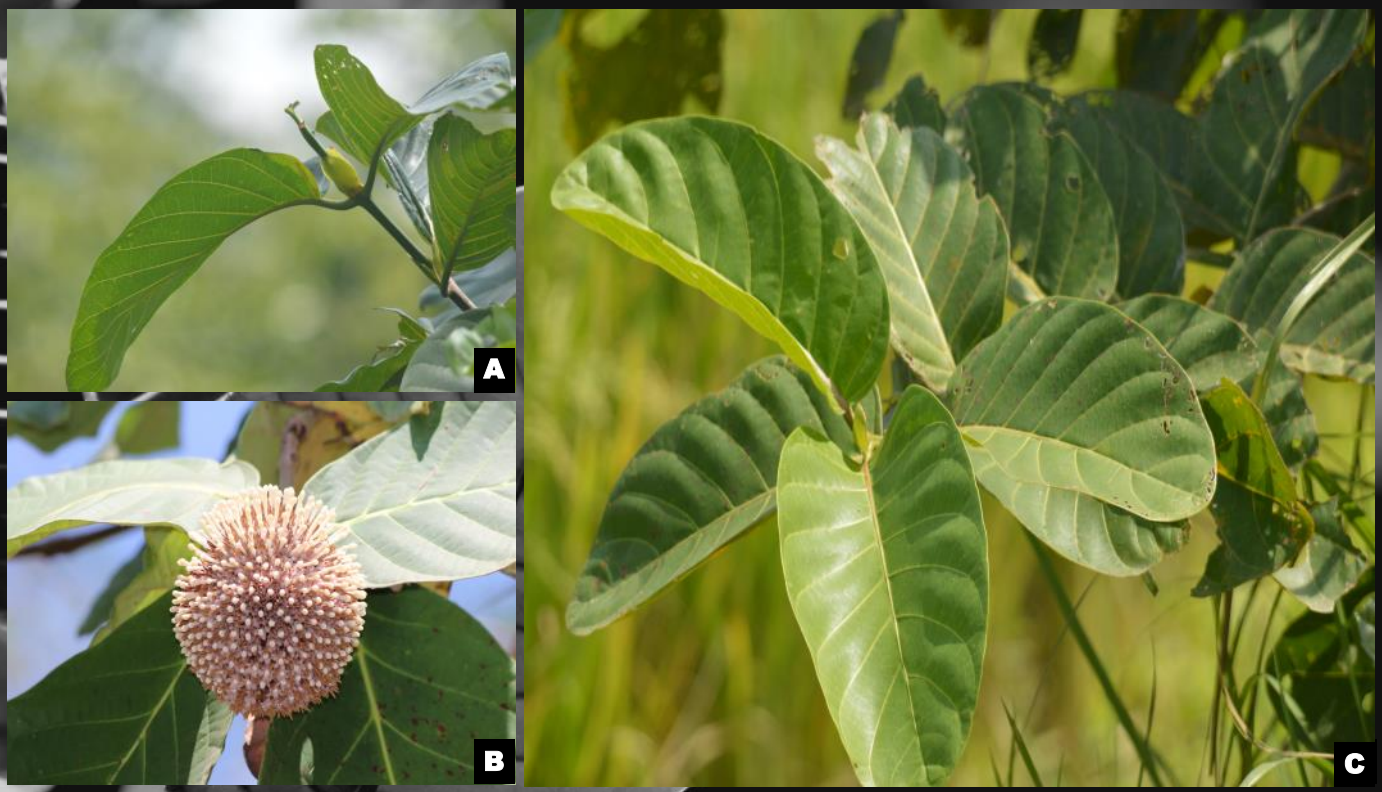
Where to find — Common in evergreen forest, especially in secondary forest, and sometimes even dominant in the undergrowth. It also occurs in scrubby vegetation and on open rocky ground.

Bangkal

Nauclea orientalis (L.) L.

Bangkal

Nauclea orientalis (L.) L. — ***Rubiaceae*** (Madder family)



A. Profile of leaf. **B.** Flower/Seed. **C.** Phyllotaxy or leaf arrangement .

Year first Described	1762	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Leichhardt Pine (English); Balikakak, kabag, and mabalot (Bisaya); Alantap (Ayangan); Analtap (Tuwali)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed, cuttings

Notable features — **A small to fairly large tree** up to 35 m tall; **Bark** surface is smooth to irregularly fissured and cracking sometimes scaly grayish-brown to reddish-brown; **Leaves** are large and dark glossy green with prominent yellow venation; **Flowers** are small with orange-yellow petals and protruding white stamens, and stick out collectively from a central point, giving the inflorescence the look of small spiky balls; **Seed** is ovoid to ellipsoid, sometimes slightly bilaterally compressed, not winged.

Uses — **Wood** for light framing, interior joinery, flooring, furniture, cabinet work, moldings, veneer and plywood; Also used for house construction and the wood is considered suitable for making a good pulp for paper production.

Where to find — Found in secondary forests lowland and hill forests sometime up to 1,100 m altitude, often along streams, and also in swampy locations.

Bignai

Antidesma bunius (Blanco) J.F. Macbr.

Bignai

Antidesma bunius (Blanco) J.F. Macbr. ***Phyllantaceae*** (Phyllanthus family)

A. Phyllotaxy or leaf arrangement. **B.** Profile of juvenile leaf. **C.** Profile of mature leaf. **D.** Cluster of fruit.

Year first Described	1824	**Timber Classification**	n/a
Vernacular Name/s	Bugnay (Ilocos Sur, Abra, Cagayan, Nueva Ecija, Camarines, Mindoro. Bunei (Bontoc); Bunnai (Isabela); Pagiruga (Cagayan); Bunneh (Tuwali); Fugnay (Ayangan)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed, cuttings, air layering, and grafting

Notable features **A small tree** 4-10 m in height; **Flowers** are small and green; **Leaves** are small, shiny, somewhat oval in shape, pointed at the tip, rounded or pointed at the base, and 8-20 cm long; **Fruit** is ovoid, red, about 8mm long, fleshy, acid and edible; It contains a single seed.

Uses **Wood** for fence posts, tool handles and walking sticks; **Bark** yields a strong fiber for rope and cordage; **Fruits** are edible and made into jam and jelly; **Young shoots** are edible, eaten raw in salads, or stewed with rice; also source of blue dye.

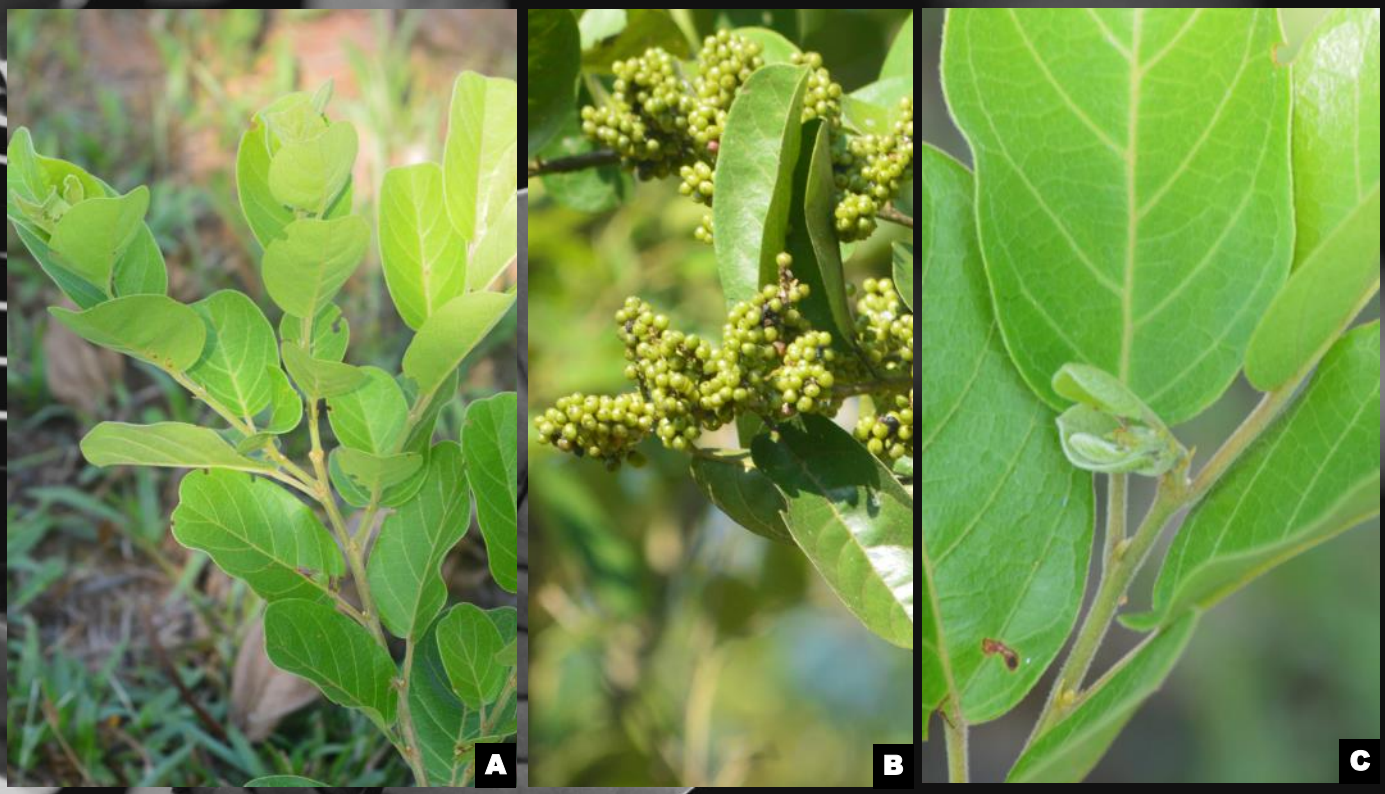
Where to find Common and widely distributed in open places and second-growth forests. It is rarely cultivated. It is one of the commonest trees in the first stages of the invasion of grassland by second-growth forests.

Binayuyu

Antidesma ghaesambilla Gaertn.

Binayuyu

Antidesma ghaesambilla Gaertn. *Phyllantaceae* (Phyllanthus family)



A. Leaf arrangement. **B.** Fruit. **C.** Profile of leaves and shoot.

Year first Described	1788	**Timber Classification**	n/a
Vernacular Name/s	Arosep (Ilokano); tubo-tubo (Bikolano); kakapal (Bisaya); Pod-pod (Ifugao)	**Conservation Status**	CR EN VU CD NT **LC** DD Least concern
Distribution	Evenly distributed throughout the landscape	**Propagation**	Seed

Notable features **A small deciduous tree** which can grow up to 16 m tall with light grey bark; **Leaves** are papery to thinly leathery, covered with fine hairs, oblong in shape (sometimes ovate or drop shaped); **Flowers** are tiny yellow-green to yellow-red flowers are borne on branched axillary or terminal inflorescences axillary and terminal; **Fruits** are fleshy ellipsoid drupes that are somewhat flattened, ripening red.

Uses **Wood** is red, hard and used for small constructions; Fruits are eaten raw and prepared into jams, etc; **Young shoots** are used as a vegetable and as a spice; **Leaves** are used in traditional medicine against fever.

Where to find Grows in gallery forest, monsoon forest and closed forest often on heavy soils subject to water–logging during the wet season. Altitudinal range from near sea level to 600 m.

Binuang

Octomeles sumatrana Miq.

Binuang

Octomeles sumatrana Miq. — *Tetramelaceae* (Datiscaceae family)

A. Habit of mature tree. **B.** Phyllotaxy or leaf arrangement.

Year first Described	1861	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Bilus (Tagalog); Sanew (Cagayan); Baring (Nueva ecija); Samak (Tarlac); Binua (Zambales); Banuang (Zambaonga); Tabanwang (Iloko and Ifugao)	**Conservation Status**	CR EN VU CD NT LC DD Least Concern (IUCN 2.3)
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed

Notable features: **A colossal, dioecious evergreen tree** (60-75 m tall) with a semi-globular crown with a pagoda-like branching habit; **Bark surface** fissured or irregularly cracked, often pustular, grey to grey-brown.

Uses: **Wood** (soft and light) for match boxes, concrete molds, pallets and pulps; **Bark** for dye; Leave is used as a relief from stomach pains; Young leaves can be cooked and eaten as vegetables.

Where to find: It grows in lowland evergreen rain forest, up to 1000 m altitude. It is especially common in natural secondary and seral riverine alluvial forest.

Bolong-eta

Diospyros pilosanthera Blanco

Bolong-eta

Diospyros pilosanthera Blanco — *Ebenaceae* (Ebony family)

A. Phyllotaxy or leaf arrangement. **B.** Fruit. **C. Bark** **D. Mature leaves** **E.** Profile of immature inflorescence.

Year first Described	1837	**Timber Classification**	Premium
Vernacular Name/s	Balatinau (Tagalog); Ebony tree (English); Malatalang (Pangasinan); Dalandong (Bikol); Hog-hog (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Endangered (DENR-DAO 2007-01)
Distribution	Jose Ancheta, Gabriella Silang, Victoria, Baguio Village, Don Mariano Perez	**Propagation**	Seed, stump cuttings

numerous, alternate, leathery, smooth when old, oblong or oblong-ovate, with pointed tip and usually rounded base; **Flowers** are dioecious, white in color; **Fruit** is berry, sub ellipsoid, about 2 centimeters across, and subtended by an enlarged persistent woody calyx.

Uses: **Wood** for furniture, cabinet work, and woodworks; **Bark** has medicinal value (cough).

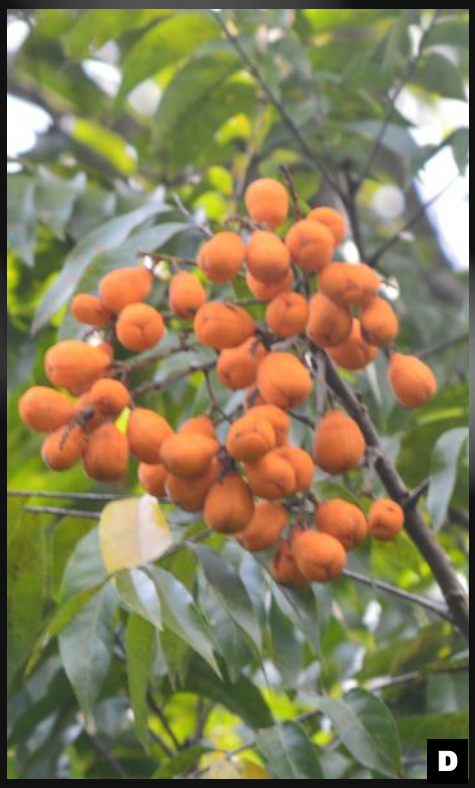
Where to find: In secondary forests usually present as a pre-disturbance remnant tree or in undisturbed mixed dipterocarp forests at elevation up to 1,600 m.

Dao

Dracontomelon dao (Blanco) Merr. & Rolfe

Dao

Dracontomelon dao (Blanco) Merr. & Rolfe — *Anacardiaceae* (Cashew family)



A. Habit of mature tree. **B.** Leaf arrangement. **C.** Profile of bark. **D.** Fruit cluster (ripe).

Year first Described	1908	**Timber Classification**	Premium
Vernacular Name/s	Paldao (Tagalog), Pacific walnut (English); Kamarag (Iloko); Challigan (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (DENR AO 2007-01)
Distribution	Baguio Village, Jose Ancheta	**Propagation**	Seed, Clones

Notable features **Large evergreen tree** (3-6 m tall); **Bark** smooth greyish-brown (outside) and pink (inside); exudes sap that turns golden when aerated; **Leaf** compound-pinnate, spirally arranged around the twigs; with flanging buttress; common canopy tree.

Uses **Wood** (soft and lightweight) for furniture, paneling and boxes; **Bark** for brown colored dye; **Fruit** for consumption (raw), other medicinal purposes.

Where to find Moist primary rainforests, especially along riverbanks and in swampy sites, occasionally flooded for short periods.

Dita

Alstonia scholaris (L.) R. Br.

Dita

Alstonia scholaris (L.) R. Br. — *Apocynaceae* (Dogbane family)

A. Habit of mature tree. **B.** Profile of mature leaf. **C.** Bark

Year first Described	1810	**Timber Classification**	Pulpwood and Matchwood species
Vernacular Name/s	Andaragan (Isabela, Cagayan); Dirita (Bataan); Dita (Tagalog, Bikol); Manakat (Quezon); Pollay (Ayangan); Po-leh (Tuwali); Dalipawen (Iloko)	**Conservation Status**	CR EN VU CD NT **LC** DD Least concern
Distribution	Eden, Jose Ancheta, Baguio Village, Don Mariano Perez, Calaocan, San Manuel	**Propagation**	Seed, hardwood cutting

Notable features **A medium to large tree**, to about 40 m high with a somewhat tessellated corky grey to grey white bark; **Boles** of larger trees are strongly fluted to 10 m; **Outer blaze** is cream to yellowish in color with abundant, milky latex that flows rapidly when cut.

Uses **Wood** for furniture, paneling and boxes; **Bark** for brown colored dye; **Fruit** for consumption (raw), other medicinal purposes; **Bark** contains bitter sap that has many medicinal uses such as astringent tonic, for fever and as cure for malaria, dysentery and chronic diarrhea.

Where to find In evergreen, deciduous or mixed forest, on forest margin and sometimes cultivated as ornamental flowers.

Duhat

Syzygium cumini (L.) Skeels

Duhat

Syzygium cumini (L.) Skeels

Myrtaceae (Myrtle family)

A. Habit of mature tree. **B.** Fruit cluster (ripe). **C.** Profile of juvenile leaf. **D.** Profile of mature leaf.

Year first Described	1912	**Timber Classification**	n/a
Vernacular Name/s	Jambolan, black plum (English); Lomboy (Ilocano, Tagalog); Duat (Pampanga)	**Conservation Status**	CR EN VU CD NT **LC** DD Least concern
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed, cuttings

Notable features **A smooth tree** (8-15 m) high with white branches and reddish young shoots; **Bark** is rough, cracked, flaking and discolored on the lower part of the trunk; **Leaves** have a turpentine smell, and are opposite, oblong-oval or elliptic, pinkish when young, becoming leathery, dark-green above, lighter beneath; **Flowers** are fragrant and appear in clusters, white at first, becoming rose-pink; **Fruit** appear in clusters of just a few or 10–40, are round or oblong, turning from green to light-magenta, then dark purple or nearly black.

Uses **Wood** for construction, boat building, plywood, tool handles, firewood and charcoal; **Bark** produced tannin and brown dye used in coloring and preserving fishnets.

Where to find It is commonly cultivated and thus found in and around homesteads and agricultural land.

Dungon-late

Heritiera littoralis Aiton

Dungon-late

Heritiera littoralis Aiton

Malvaceae (Mallow family)

A. Phyllotaxy or leaf arrangement. **B.** Profile of mature leaf. **C.** Profile of juvenile leaf.

Year first Described	1789	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Mala-dungon (Tagalog); Palungapoi (Ilokano); Dungon-dagat (Bikolano)	**Conservation Status**	CR EN VU CD NT LC DD Least concern (IUCN 3.1)
Distribution	Jose Ancheta, Baguio village, Dingasan, Eden, Dibibi	**Propagation**	Seed

Notable features **Evergreen tree** up to 5-15 m tall or more; **Bark** is grayish, fissured, and scaly; **Leaves** are oblong-ovate, leathery dark green above and silvery white below; **Flowers** are numerous, yellowish-greenish, bell-shaped; **Fruit** are egg-shaped, woody with a ridge along the center of one side so that they resemble boats with a sail, pale green ripening to glossy brown or purple in color.

Uses **Wood** (heavy to very hard) for piling, posts, foundation, ship building, joists, rafters, and handle tools; **Wood pulp** is suitable for the production of wrapping, writing and printing paper; **Bark tannin** for toughening fishnets.

Where to find Occurs on the landward side of mangroves, where fresh water mixes with sea water or predominates (estuary); also found on rocky shores, and more often on the banks of tidal rivers.

Guijo

Shorea guiso (Blanco) Blume

Guijo

Shorea guiso (Blanco) Blume — *Dipterocarpaceae* (Dipterocarp family)

A. Habit of mature tree. **B.** Profile of leaf and shoot. **C.** Profile of mature leaf. **D.** Phyllotaxy or leaf arrangement.

Year first Described	1852	**Timber Classification**	Guijo Group
Vernacular Name/s	Guijo (Tagalog), Red Balau (English); Kuriwet (Iloko); Poliguet (Ayangan); Kuliwet (Tuwali)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (IUCN 3.1)
Distribution	Jose Ancheta, Diodol, San Manuel, Calaocan, Dibibi, Dingasan, Baguio Village, Ifugao Village, Balligui, Don Mariano Perez	**Propagation**	Seed

Notable features **A large, medium-sized tree** (50-60 m tall); It has a strongly buttressed hole at the lower portion of the trunk; **Leaves** are alternate, simple, entire, and ovate-oblong, with a rounded base and tapering tip; **Flowers** are short-stalked, developing into winged fruits which are expanded at the base.

Uses **Wood** (hard to moderately heavy) for light construction and furniture; **Dammar resin** for making varnishes and paints.

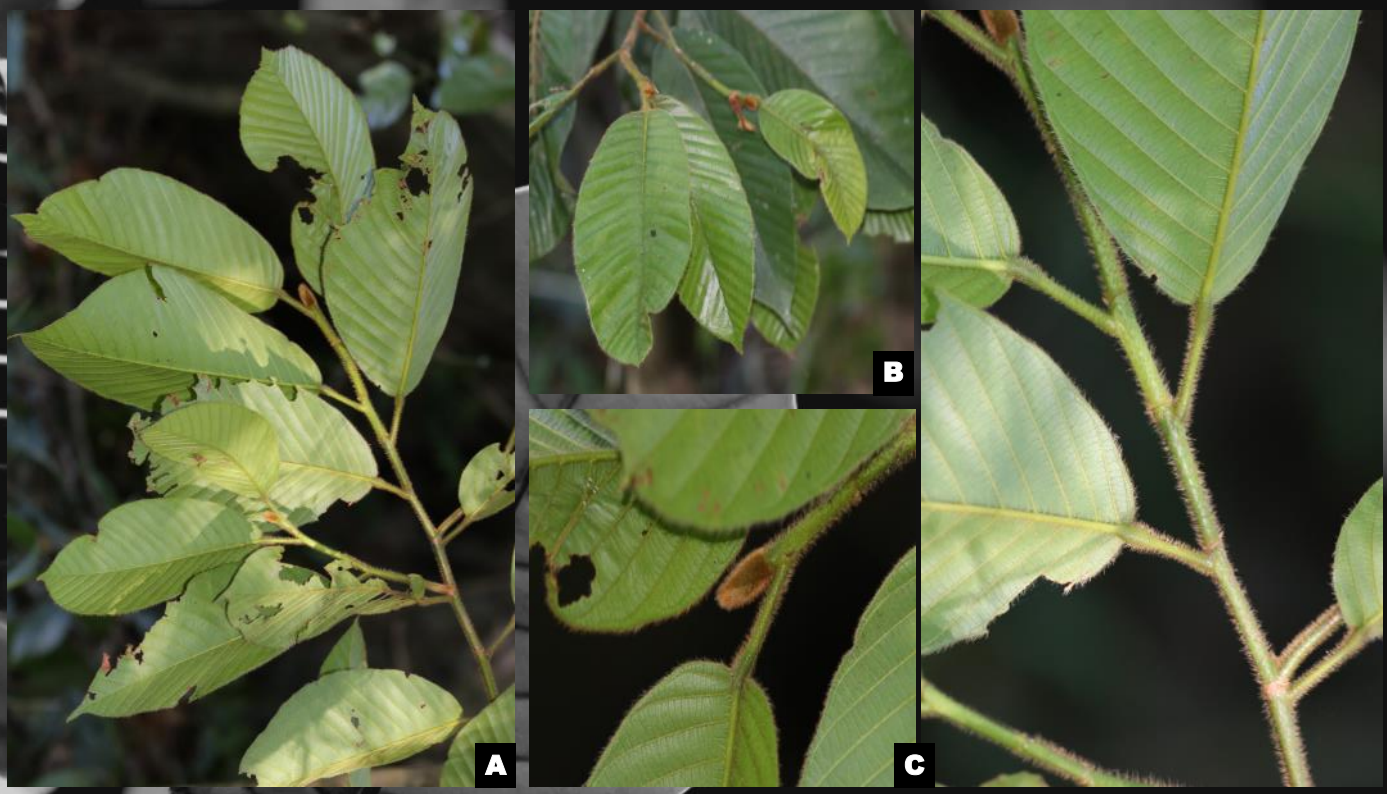
Where to find In undisturbed forests up to 400 m altitude. Usually on ridges with sandy and limestone soils. Scattered in lowland forest on red soils, most common in slightly seasonal climates.

Hairy-leafed apitong

Dipterocarpus alatus Roxb. ex G. Don

Hairy-leafed apitong

Dipterocarpus alatus Roxb. ex G. Don ***Dipterocarpaceae*** (Dipterocarp family)



A. Phyllotaxy or leaf arrangement. **B.** Profile of leaf. **C.** Visible hair on leaves and stem (Hirsute).

Year first Described	1831	**Timber Classification**	Apitong Group
Vernacular Name/s	Apinau (Tagalog); Ayamban (Iloko); Choko (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (IUCN 3.1)
Distribution	Jose Ancheta, Don Mariano Perez, Baguio Village. Ifugao Village, Calaocan	**Propagation**	Seed, cuttings

Notable features **A medium-sized to large, resinous tree** (45-65 m tall) with an umbrella-shaped canopy straight, cylindrical trunk that can be up to 150 cm in diameter; **Bark** surface orange-brown to greyish; **Leaves** are alternate, simple, leathery and rarely thin.

Uses **Wood** for medium to heavy constructions, plywoods and waterproofing;
Resin used to produce paint varnish, lacquer and for torches.

Where to find Found in lowland tropics with an elevation up to 500 meters. Typically on alluvial soils along the banks of large fresh water streams, along the bottom of ridges, in valleys and in moist and swampy areas.

Himbabao

Broussonetia luzonica (Blanco) Bureau

Himbabao

Broussonetia luzonica (Blanco) Bureau — ***Moraceae*** (Breadfruit family)

A. Phyllotaxy or leaf arrangement. **B.** Fruit. **C.** Profile of leaf.

Year first Described	1873	**Timber Classification**	Pulp and Matchwood Species
Vernacular Name/s	Alokon (Tagalog); Balong-kadios; (Bisaya); Baeg and Alukon (Ilokano); Birch flower (English); Ame (Isinai)	**Conservation Status**	CR EN VU CD NT LC DD Potentially threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed, cuttings

Notable features — **A medium-sized deciduous tree** growing to a height of 15 meters; **Bark** is grey and smooth; **Leaves** are alternate with a pointed apex and rounded base. Lower leaf surface is hairy; **Flowers** are very small, borne on long, slender, spike-like flowering branches; **Fruit** is spherical, lumpy and green.

Uses — **Wood** for paneling, furniture and musical instruments; **Bark fiber** is used to make high quality paper and making rope; **Young leaves and flowers** for raw or cooked and eaten as vegetable.

Where to find — In thickets and second growth forests, at low and medium altitudes.

Ipil

Instia bijuga (Colebr.) Kuntze

Ipil

Instia bijuga (Colebr.) Kuntze

Fabaceae (Legume family)

A. Phyllotaxy or leaf arrangement. **B.** Flower. **C.** Profile of leaf.

Year first Described	1524	**Timber Classification**	Premium
Vernacular Name/s	Ipil-ilog, Ipil-talao (Mindoro); Tagal-tugas (Palawan); Ipil-nangka (Sulu)	**Conservation Status**	CR EN VU CD NT LC DD Endangered (DENR AO 07-01) Vulnerable (IUCN 2.1)
Distribution	Jose Ancheta, Dingasan, San Manuel, Dibibi, Don Mariano Perez, Calaocan	**Propagation**	Seed, cuttings

Notable features **A medium-sized, evergreen tree** with a spreading crown; It can grow up to 40 m tall; **Bark** is gray in color with an orange tinge; Leaves are alternate and simply compound with usually two pairs of leaflets; **Flowers** are fragrant, white or reddish in color.

Uses **Wood** (hard to heavy) for house building, posts, beams, furniture and carving; **Bark** is source of tannin; seeds are edible when soaked in salt water for 3 - 4 days and then boiled

Where to find Found on sand and coral beaches, but also features in periodically inundated localities further inland. It also occurs in dryland mangroves which are the final stage of mangrove forest succession and the transition to inland forests. forests.

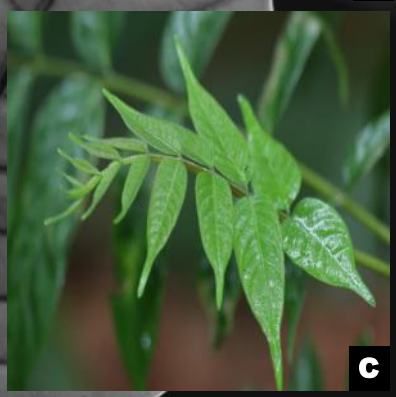
Kalantas

Toona calantas Merr. & Rolfe

Kalantas

Toona calantas Merr. & Rolfe

Meliaceae (Mahogany family)



A. Phyllotaxy or leaf arrangement. **B.** Profile of leaf. **C.** Profile of juvenile leaf. **D.** Fruit cluster.

Year first Described	1908	**Timber Classification**	Premium
Vernacular Name/s	Lanipga (Bicol, Cebu); Bantinan (Cagayan, Mt. Province); Philippine cedar (English); Fangtinon (Ayangan); Bangtinon (Tuwali)	**Conservation Status**	CR EN VU CD NT LC DD DENR (AO 07-01) Endangered (IUCN 2.3)
Distribution	Jose Ancheta, Don Mariano Perez, Balligui, Baguio village	**Propagation**	Seed

Notable features **A deciduous tree** growing up to 25-35 m tall; **Trunk** is terete and straight; **Bark** is yellowish to dark brown; **Leaves** are compound, alternate oblong/broadly lanceolate; **Fruits** are ellipsoid capsule; **Seeds** are distinctly but unequally winged at each side.

Uses **Wood** (soft and lightweight) for furniture, boxes, and plywood; **Bark** for brown colored dye; **Fruit** for consumption (raw), other medicinal purposes.

Where to find Generally scattered in the forest hills and in primary forests at low and medium altitudes. It prefers deep, well-drained soils.

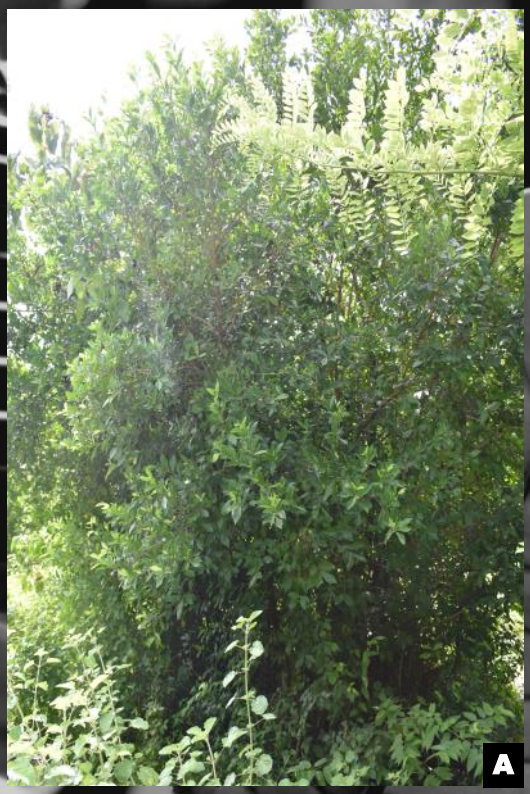
Kalios

Sterblus asper Lour

Kalios

Sterblus asper Lour.

Moraceae (Breadfruit family)



A. Habit of tree. **B.** Phyllotaxy or leaf arrangement. **C.** Profile of leaf.

Year first Described	1790	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Ampas (Pampanga); sandpaper tree (English); audig (Ilokano); kakadli (Tagalog); Upla (Tuwali); Apla (Ayangan);	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape	**Propagation**	Seed

Notable features **A small, evergreen rigid** and densely branched tree (4-15 m) high; **Bark** is rough grey to greenish in color; **Leaves** are simple, alternate, rhomboid, elliptic, acute or acuminate more or less crenate-scabrid on both surfaces; **Flowers** are in roundish heads, short-peduncle, greenish-yellow or nearly white; **Fruits** are yellow when ripe and single seeded; Seeds are smooth, round, greenish-white in color and light in weight.

Uses **Bark** for an antidote in snake poisoning, treats leprosy, diarrhea and anti-malaria defense; **Fiber** from the plant is used for making paper; **Leaves** (rough and course) use for sandpaper for smoothing and polishing wood;

Where to find It is found in the surroundings of villages, open areas, borders of rice fields and secondary forest at elevations from sea-level to 1,000 m.

Kalubkob

Syzygium calubcob (C.B.Rob.) Merr.

Kalubkob

Syzygium calubcob (C.B.Rob.) Merr. — *Myrtaceae* (Myrtle family)

A. Phyllotaxy or leaf arrangement. **B.** Profile of juvenile leaf. **C.** Profile of mature leaf.

Year first Described	1951	**Timber Classification**	n/a
Vernacular Name/s	Balanga (Bisaya); barabak (Ilokano)	**Conservation Status**	CR EN VU CD NT LC DD
Distribution	Diodol, Dingasan, Jose Ancheta	**Propagation**	Seed

Notable features — **A small to medium-sized tree** (25-30 m tall); **Bark** surface is greyish to dark red; **Leaves** are elliptical-oblong to lanceolate, with distinct secondary vein; **Flowers** are subsessile or shortly pedicelled, in inflorescences from below the leaves or terminal, white, with 4 large sub-persistent lobes; **Fruit** is subglobose berry, 3-5 cm in diameter with a large flat calyx rim, yellow-green.

Uses — **Wood** (heavy to moderately hard) for cigar boxes, furniture, and plywood; **Fruit** is edible and tasty.

Where to find — Widely distributed and common in thickets and forest at low and medium altitudes.

Kalumpit

Terminalia microcarpa Decne.

Kalumpit

Terminalia microcarpa Decne. — *Combretaceae* (Terminalia family)

A. Habit of seedling. **B. Habit of sapling and** Phyllotaxy or leaf arrangement

Year first Described	1834	**Timber Classification**	Timber/Construction Hardwood
Vernacular Name/s	Alupi, kalupi, kalusit (Cagayan); Ambobok, ambobonat (Isabela); Alutek (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Limited distribution
Distribution	Jose Ancheta, Eden, Dingasan, Dibibi, Victoria, San manuel, Baguio Village, Eden, Calaocan	**Propagation**	Seed

Notable features — **A semi-deciduous tree** growing to a height of 25 meters and a diameter of 1 meter; **Bark** is black, hard, and fissured; **Leaves** are smooth, and pointed at both ends; **Flowers** are small, yellowish-white, on slender spikes growing from the axil of the leaves; **Fruit** is about 3 centimeters wide, smooth, and dark red when ripe, fleshy and sour.

Uses — **Wood** for light construction; **Fruits** are edible, commonly used to make jam and preserves; also used to sweeten and age lambanog (coconut liquer), a local wine; **Bark** tannin for making tannin extract or for leather tannery.

Where to find — Primary forests at low elevations; also drier types of rainforest; rainforest margins and banks of large streams.

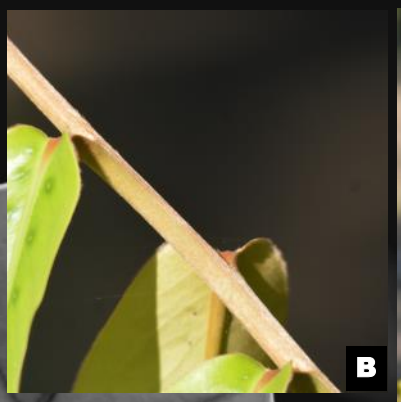
Kamagong/Mabolo

Diospyros blancoi A. DC

Kamagong / Mabolo

Diospyros blancoi A. DC

Ebenaceae (Ebony family)



A. Habit of mature tree. **B.** Visible trichomes (small hair). **C.** Fruit. **D.** Leaf and shoot.

Year first Described	1844 syn. ***D. philippinensis* A. DC.**	**Timber Classification**	Premium
Vernacular Name/s	Mabolo, Kamagong, Talang (Tagalog); Velvet apple (English)	**Conservation Status**	CR EN VU CD NT LC DD Critically endangered (DENR DAO 07-01) Endangered (IUCN 2.3)
Distribution	Jose Ancheta, Don Mariano Perez, Dingasan, Ifugao Village, Calaocan, Victoria, Dibibi	**Propagation**	Seed, cuttings

Notable features **Evergreen tree** (7-15 m) tall; **Leaves** in the upper surface is dark-green and shiny, while the lower surface is silvery and hairy; **Young leaves** are pinkish in color; **Fruits** are fleshy berries with a reddish brown velvet skin and creamy white to yellow flesh that is sweet and aromatic; **Fruits** are said to emit a strong odor that resembles cheese.

Uses **Wood** for house construction, furniture and tool handles; **Leaves** for treating itchy skin; Bark for treating coughs, fevers, dysentery and diarrhea; **Fruit** is edible when ripe.

Where to find It is very common and widely distributed in primary and secondary forests at low and medium altitudes.

Kapulasan

Nephelium ramboutan-ake (Labill.) Leenh

Kapulasan

Nephelium ramboutan-ake (Labill.) Leenh *Sapindaceae* (Soapberry family)

A. Habit of mature tree. **B.** Immature fruit **C.** Profile of young shoot. **D.** Mature fruit (ripe).

Year first Described	1986	**Timber Classification**	n/a
Vernacular Name/s	Bulala, panungayan (Tagalog); Sugod-sugod (Tuwali)	**Conservation Status**	CR EN VU CD NT LC DD Limited distribution
Distribution	Jose Ancheta, Calaocan, Dingasan, San Manuel, Diodol, Balligui, Victoria	**Propagation**	Seed, grafts, air layers

Notable features **Evergreen tree** (10- 24 m) tall; **Leaves** are alternate and pinnately compound, each with 2-5 pairs of leaflets, which are a glossy dark green on top with short silky hairs on the underside; **Flowers** are greenish, each having 4-5 hairy sepals but no petals; **Fruits** are broadly ovoid, crimson to dark purple in color with short blunt spines.

Uses **Wood** for general construction but rarely used; **Fruit** is edible with economic potential; **Seeds** are edible when roasted with oil extract.

Where to find In undisturbed to slightly disturbed (open sites) mixed dipterocarp and sub-montane forests up to 1300 m altitude. Usually on alluvial sites and along rivers and streams, but also on ridges. On sandy to clay soils. In secondary forests usually present as a pre-disturbance remnant.

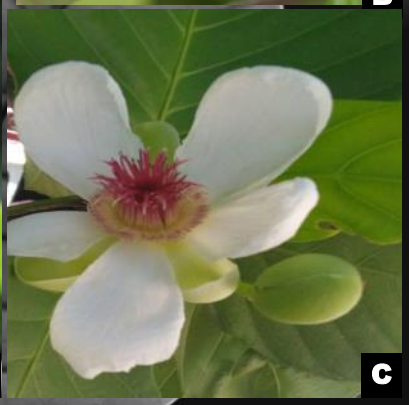
Katmon

Dillenia philippinensis Rolfe

Katmon

Dillenia philippinensis Rolfe

Dilleniaceae (Simpoh family)



A. Profile of leaf. **B.** Fruit. **C.** **Flower** **D.** Phyllotaxy or leaf arrangement.

Year first Described	1884	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Philippine catmon (English); Katmon (Tagalog, Bisaya, Pampanga); Ukkapon (Ayangan); Uppakon (Tuwali); Kusikus (Iloko)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (IUCN 2.3) Vulnerable (DENR DAO 07-01)
Distribution	Jose Ancheta, Balligui, Dingasan, Victoria	**Propagation**	Seed, grafts, air layers

Notable features **A small, evergreen tree** (6-15 m) tall; Bark is shallowly fissured and greyish-brown to reddish-brown; **Leaves** are green elliptic to oblong-ovate, simple and alternate arrangement, margins serrate, and venation prominent; **Flowers** are white, large, soft, and showy; **Fruits** are rounded, with large fleshy sepals tightly enclosing the true fruit.

Uses **Wood** for general construction, furniture, plywood and wooden articles; **Fruit** is edible and use for making sauces and jams; **Bark** yields red dye.

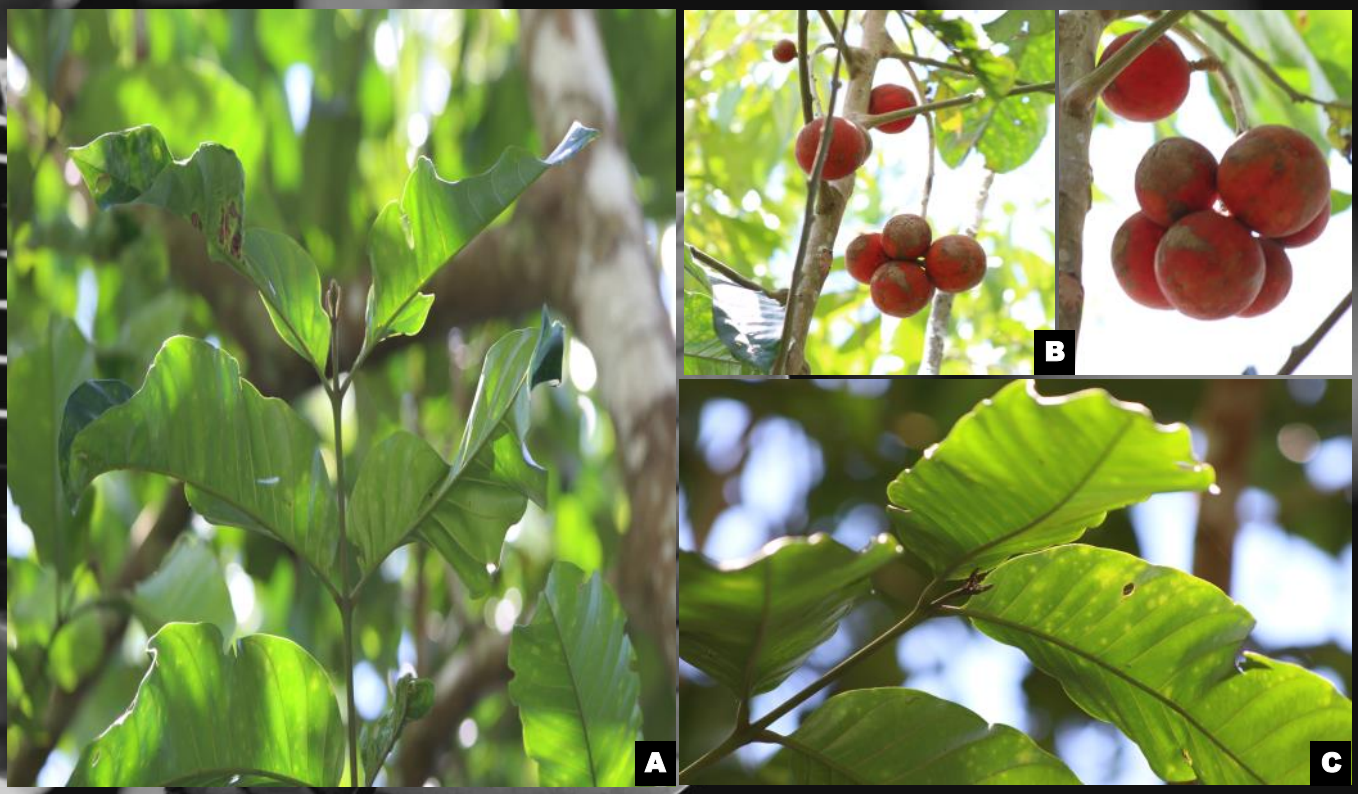
Where to find Primary forests and also in the more open, secondary formations, growing at low and medium elevations, rarely found above 1,000 m.

Katong matsing

Chisocheton pentandrus (Blanco) Merr.

Katong matsing

Chisocheton pentandrus (Blanco) Merr. — *Meliaceae* (Mahogany family)



A. Phyllotaxy or leaf arrangement **B.** Fruit. **C.** Profile of leaf.

Year first Described	**1905**	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Ibo (Bisaya); Bagolayak, Kurabdab (Bikolano); Widawid (Ilokano); Ta-ang (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Least concern (IUCN 3.1)
Distribution	Jose Ancheta, Dingasan	**Propagation**	Seed

Notable features — **Small to medium-sized tree** (18-40 m tall) with a trunk diameter of up to 60 centime tres; **Bark** is greenish grey; **Flowers** are fragrant and cream colored; **Fruits** are round or beaked, dull red, minutely tomentose, pericarp containing white latex.

Uses — **Wood** for light construction;
Oil obtained from the seed is use as a hair oil.

Where to find — In undisturbed mixed dipterocarp forests up to 400 m altitude. Usually on hillsides and ridges with sandy soils, but also on limestone.

Kupang

Parkia roxburghii G. Don

Kupang

Parkia roxburghii G. Don

Fabaceae (Legume family)

A. Phyllotaxy or leaf arrangement. **B.** leaf arrangement

Year first Described	1832	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Amarang (Palawan); Cupang or kupang (Luzon-tagalog); Tee bean (English); Agigid (Ayangan)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Jose Ancheta, Eden, Bagui Village, Calaocan, San Manuel	**Propagation**	Seed

Notable features

A medium-sized tree (25-40 m tall); **Bark** is grayish-brown; **Leaves** are evenly bipinnate; **Leaflets** are linear-oblong, close-set, shining above, and pointed at the tip; **Flowers** are white, about 1 centimeter long; **Pods** are 25 to 30 centimeters long, rather thick, pendulous, black and shining when mature, containing 15 to 20 seeds.

Uses

Wood (Poor quality timber) for temporary light construction, matches, crates, disposable chopsticks; **Fruit peel** yields a brown or black dye used for dyeing cotton and silk.

Where to find

Occurs mainly at lower elevations of the lowland and hill forests, evergreen rainforests, moist-mixed deciduous forests and dry evergreen forests usually between 0 and 600 m elevation.

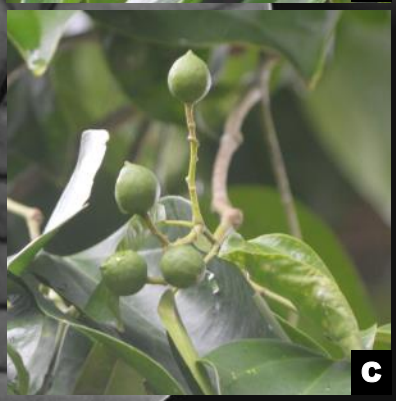
Magabuyo

Celtis luzonica Warb.

Magabuyo

Celtis luzonica Warb.

Cannabaceae (Hemp family)



A. Habit of mature tree. **B.** Profile of mature leaf. **C.** Fruit. **D.** Phyllotaxy or leaf arrangement .

Year first Described	1905	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Mala-ikmo (Southern tagalog); Hapi-hapi (Ayangan); Maragawed (Iloko)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable A1cd (IUCN 2.3)
Distribution	Jose Ancheta	**Propagation**	Seed

Notable features **A large evergreen tree** (25-30 m tall); **Bole** has prominent buttresses, and can be up to 90 cm in diameter; **Bark** is smooth yellowish-grey; **Leaves** are broad elliptic to elliptic-oblong; **Flowers** are pale white in color, elongate with hairy edges at the base; **Fruit** is globose, glabrous, and reddish-brown in color when ripe.

Uses **Wood** for general construction , furniture, cabinet work, tool handles, posts and pulp for paper; **Bark** contains yellow dye.

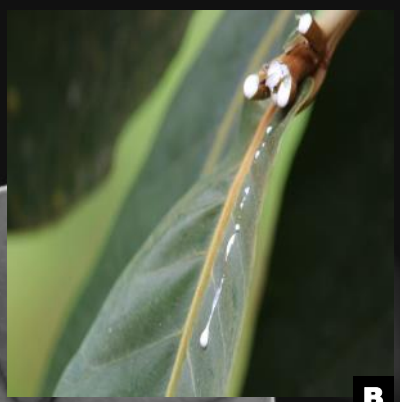
Where to find In thickets and mid-elevation forests.

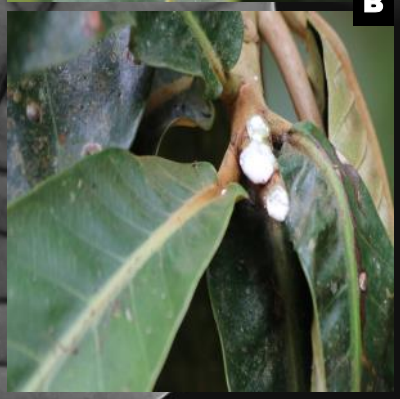
Malak-Malak

Palaquium philippense (Perr.) C.B.Rob.

Malak-Malak

Palaquium philippense (Perr.) C.B.Rob. ***Sapotaceae*** (Sapodilla family)





A. phyllotaxy or leaf arrangement. **B.** White sticky sap. **C.** Profile of mature leaf.

Year first Described	1908	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Dalakan (Iloko); manogtalisai (Panay Bisaya); Arako (Cagayan); Chalaan (Ayangan); Dalakan (Tuwali)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable A1cd (IUCN 2.3)
Distribution	Jose Ancheta	**Propagation**	Seed

Notable features **A medium-sized evergreen tree** up to 25 m tall; **Leaves** are clustered at tip of twigs, obovate, narrowly obovate to spatulate, with inconspicuous transverse tertiary venation, densely yellowish-brown hairy beneath; **Flowers** are clustered, greenish-yellow or greenish-white in color;

Uses **Wood** (moderately hard and durable) for high class furniture, cigar boxes and cabinet making; **Seeds** yield limpid, odorous oil which is employed in food as an illuminant or for cooking.

Where to find Primary forests at low and medium altitudes.

Malapapaya

Polyscias nodosa (Blume) Seem.

Malapapaya

Polyscias nodosa (Blume) Seem. — ***Araliaceae*** (Ginseng family)

A. Profile of wilding stem. **B.** Phyllotaxy or leaf arrangement. **C.** Profile of young leaf. **D.** Profile of mature leaf.

Year first Described	1865	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Bongliw (Camarines Sur); Bias-bias (Tagalog); Panalatang (Pangasinan) Chachalit (Ayangan)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed

Notable features — **A small to medium-sized evergreen tree** (25-30 m) tall; **Bark** surface with vertical lines, pale grey to brown in color; **Crown** sparsely branched, branches slender and rather flexuous, crowned with large leaves; **Leaves** are arranged spirally, crowded at the end of branches; **Flowers** are attached directly to a branch; **Petals** are broadly oblong, valvate, acute, yellowish green in color; **Fruits** are subglobose, ridged and yellowish red when dry.

Uses — **Wood** for fancy woodwork, wooden shoes, matchsticks, pencil slats, plywood, boxes and crates; Leaves are use for purpuric fever and as a contraceptive, also as a fish poison.

Where to find — Found scattered in open thickets and second growth forests at low and medium altitudes. It also grows in moist areas along gullies and creeks.

Manalu

Semecarpus longifolius Blume

Manalu

Semecarpus longifolius Blume — *Anacardiaceae* (Cashew family)

A. Leaf arrangement. **B.** Fruit cluster showing the accessory fruit (orange/red) and exposed seed. **C.** Fruit cluster.

Year first Described	1850	**Timber Classification**	Lesser Known Species (LKS)
Vernacular Name/s	Manalu (Bisaya, Filipino); Anagas, anagas-babae (Tagalog); Libas (Bikol); Chollocho (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Not assessed
Distribution	Don Mariano Perez	**Propagation**	Seed

Notable features **Small to medium-sized** evergreen **tree** (~30 m tall); **Trunk** erect and tapering with large butresses; **Leaf** (abaxially) greenish, (adaxially) green, elliptic to oblong; **Sap and nuts** contain irritants; Manalu has the largest leaf among *Anacardiaceae* species in the Philippines.

Uses **Wood** (moderately hard and durable) for lightweight fencing;
Fruit are edible.

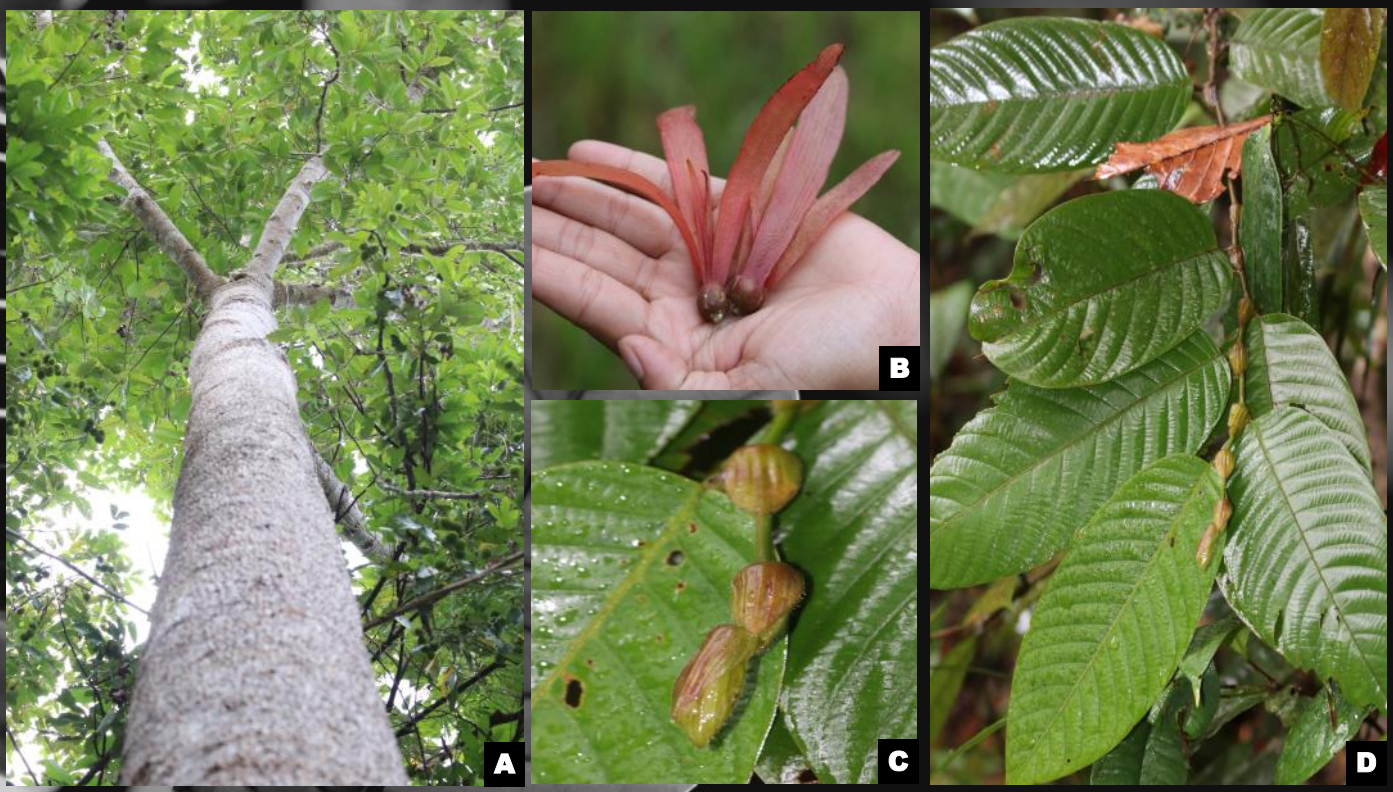
Where to find Lowland forest, sometimes at elevations up to 300 m.

Mayapis

Shorea palosapis (Blanco) Merr.

Mayapis

Shorea palosapis (Blanco) Merr. ***Dipterocarpaceae*** (Dipterocarp family)



A. Habit of mature tree. **B**. Seed. **C**. Profile of shoot. **D**. Phyllotaxy or leaf arrangement.

Year first Described	1918	**Timber Classification**	Philippine Mahogany group
Vernacular Name/s	Mayapis, tabak (Tagalog); Pura (Bicol); Apnit (Tuwali); Fuju-an (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Critically Endangered (IUCN 2.3)
Distribution	Don Mariano Perez, Calaocan, Baguio Village, Jose Ancheta, Eden, Ifugao Village, Balligui, Victoria, Dibibi	**Propagation**	Seed, cuttings

Notable features **A large evergreen tree** up to 50 m tall; **Bark** is light brown, smooth when young, finely ridged to fissured when mature; **Leaves** are simple, alternate, oblong to leathery, blade smooth on the surface, covered with minute pubescence underneath; **Flowers** are in terminal or axillary panicles; Petals are creamish or light yellowish in color; **Fruits** with three prominent long wings.

Uses **Wood** for furniture and interior work, veneer and plywood, musical instruments, boat planking and for numerous other purposes; **Wood extractives** are tumor inhibiting.

Where to find Widespread, often abundant, in lowland, evergreen, mixed Dipterocarp forest on fertile well drained soils; at elevations below 300 meters.

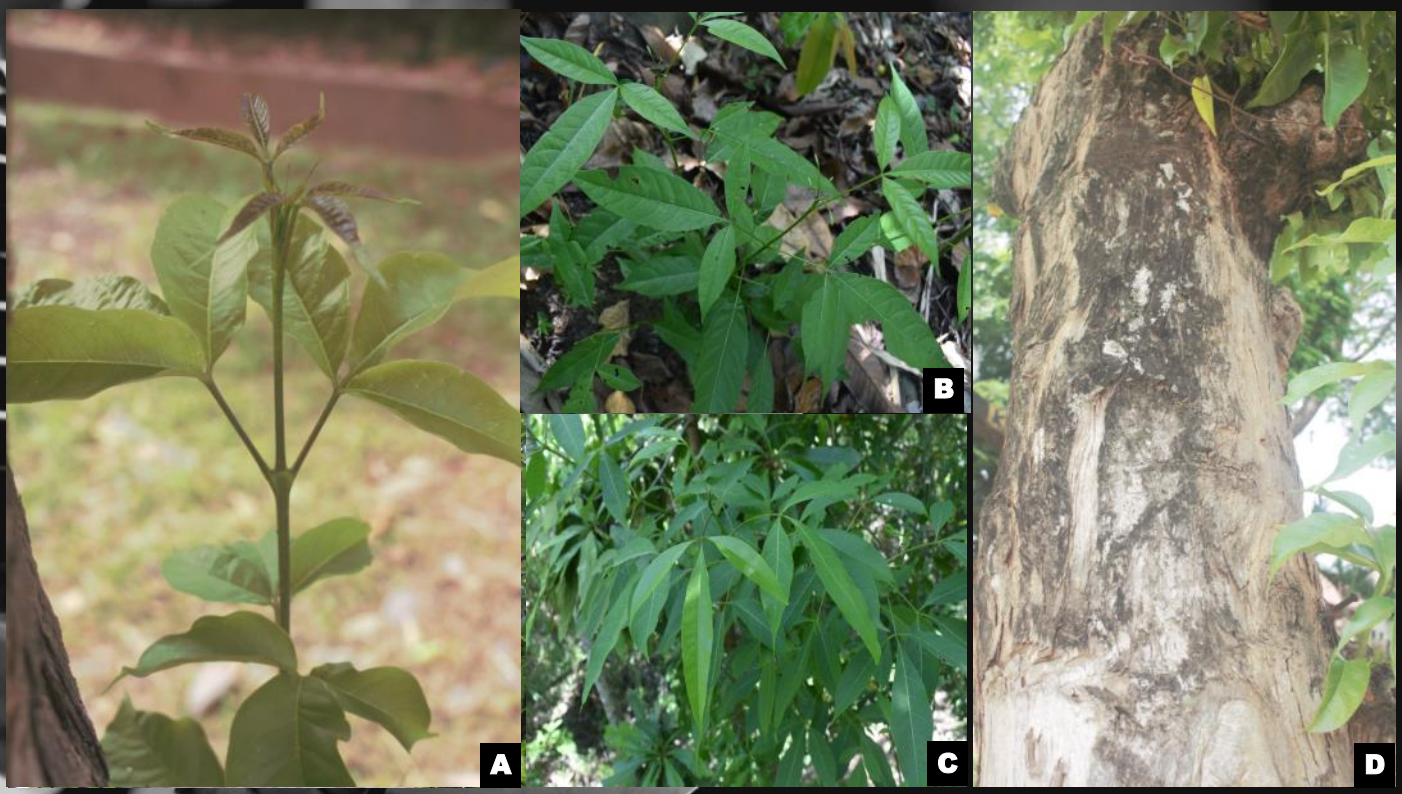
Molave

Vitex parviflora Juss

Molave

Vitex parviflora Juss

Verbenaceae (*Flowering Plant Family*)



A. Profile of shoot. **B. Habit of wildlings** **C.** Phyllotaxy or leaf arrangement. **D.** Bark.

Year first Described	1806	**Timber Classification**	High-grade timber
Vernacular Name/s	Mulawin, Tugas, Sagat *Mulawin* (Tagalog) Murauin, Salingkapa (Bisaya) Sagad (Ilokano)	**Conservation Status**	CR EN VU CD NT LC DD Vulnerable (IUCN A1cd)
Distribution	Baguio Village, Ifugao Village, Jose Ancheta, Eden, Balligui, Victoria, Dibibi, Dingasan	**Propagation**	Seeds and stem cuttings

Notable features Tree with very hard wood, reaching a height of from 8 to 15 m, glabrous or nearly so, or the inflorescence puberulent. Leaflets 3, petioled, ovate to lanceolate, 7 to 18 cm long, shining, quite glabrous. Inflorescence terminal, paniculate, ample, up to 20 cm long, usually some- what pyramidal, many-flowered. Flowers blue, 6 to 8 mm long, usually the corolla pubescent outside. Fruit globose or subglobose, 5 to 6 mm in diameter.

Uses Antimicrobial and antifungal properties have been reported, considered carminative, anthelmintic, digestive; antioxidant, larvicidal, antibacterial, wound healing, anti-inflammatory, anti-ulcer, antispasmodic, wound healing properties.

Where to find Well-drained limestone soils in monsoon forest at low elevations and along sea coasts. Common in both secondary and open primary forests at elevations up to 700 metres .

Narra

Pterocarpus indicus Willd.

Narra

Pterocarpus indicus Willd.

Fabaceae (Legume family)

A. Phyllotaxy or Leaf arrangement. **B.** Profile of leaf. **C.** Flower. **D.** Fruit.

Year first Described	1763	**Timber Classification**	Premium
Vernacular Name/s	Rosewood and Philippine mahogany (English); Laga, Nala (Cagayan); Ujaw (Narra); Udyo (Tuwali)	**Conservation Status**	CR EN VU CD NT LC DD Endangered (IUCN 2.3) Critically Endangered (DAO 07-01)
Distribution	Jose Ancheta, Balligui, Baguio Village, Don Mariano Perez, Ifugao Village, Calaocan, Eden, Dibibi, Dingasan, Victoria, San Manuel, Diodol	**Propagation**	Seed, wildlings, cuttings

Notable features **Large** deciduous **tree** (~40 m tall); **Trunk and Bark** leaning, smooth to pimply when young; scaly to fissured, erect, tapering and buttressed when mature; **Leaf** hairy, round to oblong and alternately compound; the prickly form (*P. indicus* forma *echinatus*) has more prominent apex than the smooth form (*P. indicus* forma *indicus*); **Fruit** winged, papery but hard disc pods; the prickly form has spines at center; **Flower** are numerous, yellow, and faintly fragra

Uses **Wood** (moderately hard and heavy) for cabinetry, cart wheels, carving, construction, furniture, and musical instruments; **Young leaves and flowers** are said to be eaten; **Red latex** is used in folk remedies for tumors, the plant for cancers, especially of the mouth.

Where to find In lowland primary and some secondary forest, mainly along tidal creeks and rocky shores at elevations up to 750 meters.

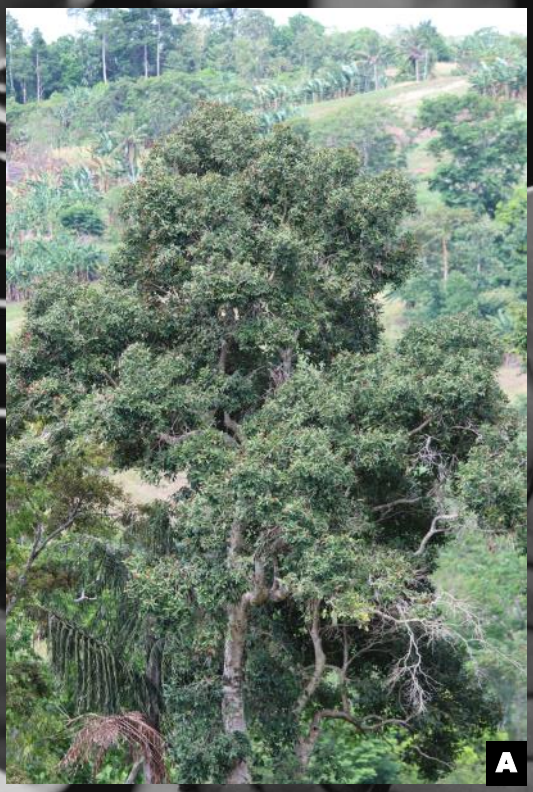
Panglomboien

Syzygium simile (Merr.) Merr

Panglomboien

Syzygium simile (Merr.) Merr

Myrtaceae (Myrtle family)



A. Habit of mature tree. **B.** Flower. **C.** Phyllotaxy or leaf arrangement. **D.** Profile of Leaf.

Year first Described	1951	**Timber Classification**	n/a
Vernacular Name/s	Panglongboien (Iloko); Malaruhat (Tagalog); Arang (Mangyan); Muning (Bisaya); Futik (Ayangan); Butik (Tuwali); Maralumboy (Iloko)	**Conservation Status**	CR EN VU CD NT LC DD Abundant
Distribution	Jose Ancheta, Calaocan	**Propagation**	Seed

Notable features **A small evergreen tree** up to 15 m tall; Leaves are opposite, shiny green, elliptical-ovate to oblong-ovate, with pairs of fairly indistinct secondary veins; **Flowers** are pink-white, in small clusters of 3, 4-5 petals; **Fruit** is subglobose berry, purplish to black in color.

Uses **Wood** for house and ship building and for implements; Pulp is eaten raw.

Where to find Forests at low to medium elevations. Broad-leaved evergreen forests, hillsides 100-400 m.

Piling liitan

Canarium luzonicum (Blume) A. Gray

Piling liitan

Canarium luzonicum (Blume) A. Gray — ***Burseraceae*** (Torchwood family)

A. Phyllotaxy or leaf arrangement. **B.** Wildlings.

Year first Described	1854	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Manila elemi (English); Sahing (Tagalog); Pili (Tagalog, Bikolano, Bisaya); Antong (Ayangan)	**Conservation Status**	CR EN **VU** CD NT LC DD Vulnerable (IUCN 2.3) Threatened (DENR DAO 07-01)
Distribution	Jose Ancheta, Don Mariano Perez, Baguio Village, Dibibi, Eden	**Propagation**	Seed, budding, grafting

Notable features — **A large semi-dioecious tree** up to 35 m in height; **Bark** surface smooth to flaky, often greyish with strong resinous odor and clear sticky or oily exudate; **Leaves** are arranged spirally, opposite and often toothed leaflets; **Flowers** are clustered and borne on large compounded inflorescences, creamy white in color, with inflexed tips; **Fruit** is drupe, hairy or glabrous, ripening blue-black, glaucous at first, very wrinkled when dry.

Uses — **Oleoresin** called elemi has a wide range of uses in food, medicine, and industrial applications; **Seeds** can be consumed raw or cooked; **Nuts** are sweet and have a delicious flavor; **Fruit pulp** is cooked while young shoots can be eaten raw.

Where to find — Occurs in primary and secondary rain forest, generally up to 500 m altitude, but occasionally up to 1800 m.

Rarang

Erythrina subumbrans (Hassk.) Merr.

Rarang

Erythrina subumbrans (Hassk.) Merr.

Fabaceae (Legume family)

A. Habit of mature tree. **B.** mature influorescence. **C.** Leaf arrangement.

Year first Described	1754	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	December tree (English); Bagbag (Iloko); Gabgab (Tuwali); Kabkab (Ayangan)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Jose Ancheta, Baguio Village, Calaocan	**Propagation**	Seed, cuttings

Notable features: **A deciduous tree** (20-35 m tall) with trunk and branches with spines; **Bark** is grey or grey-green, smooth, soft, often with spine on twigs and trunk; **Leaves** are trifoliolate, with 3 primary basal veins. **Leaflets** are broadly ovate, pointed, base rounded, margin entire; **Flowers** are large, pea-flower-shaped, and orange-color.

Uses: **Wood** used to manufacture wooden shoes; **Leaves** are used as a treatment for coughs; **Dried male flowers** can be burned to repel mosquitoes and other flying insects.

Where to find: Moist valleys, near streams, in open locations and secondary forest at low and medium elevations.

Rimas

Artocarpus altilis (Parkinson) Fosberg

Rimas

Artocarpus altilis (Parkinson) Fosberg — *Moraceae* (Breadfruit family)

A. Phyllotaxy or leaf arrangement.

Year first Described	1941	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Breadfruit (English); Tubak (Tuwali); Tufah (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Not assessed
Distribution	Balligui	**Propagation**	Seed, cuttings

Notable features — **A large evergreen tree** (15-20 m tall); **Bark** is smooth, light colored; **Leaves** are thick, leathery, dark green, often glossy, underside dull with an elevated midrib and main veins, sometimes smooth but often with few to many pale to reddish hairs, especially on the mid rib and veins; **Fruits** are large and green or yellowish, with a lumpy or spiny surface.

Uses — **Wood** (light and soft) for construction of houses and canoes; **Fruit** can be eaten raw or cooked; **Seed** are very nutritious, with a flavor somewhat reminiscent of chestnuts; **Sticky white latex** is used as a chewing gum and as an adhesive.

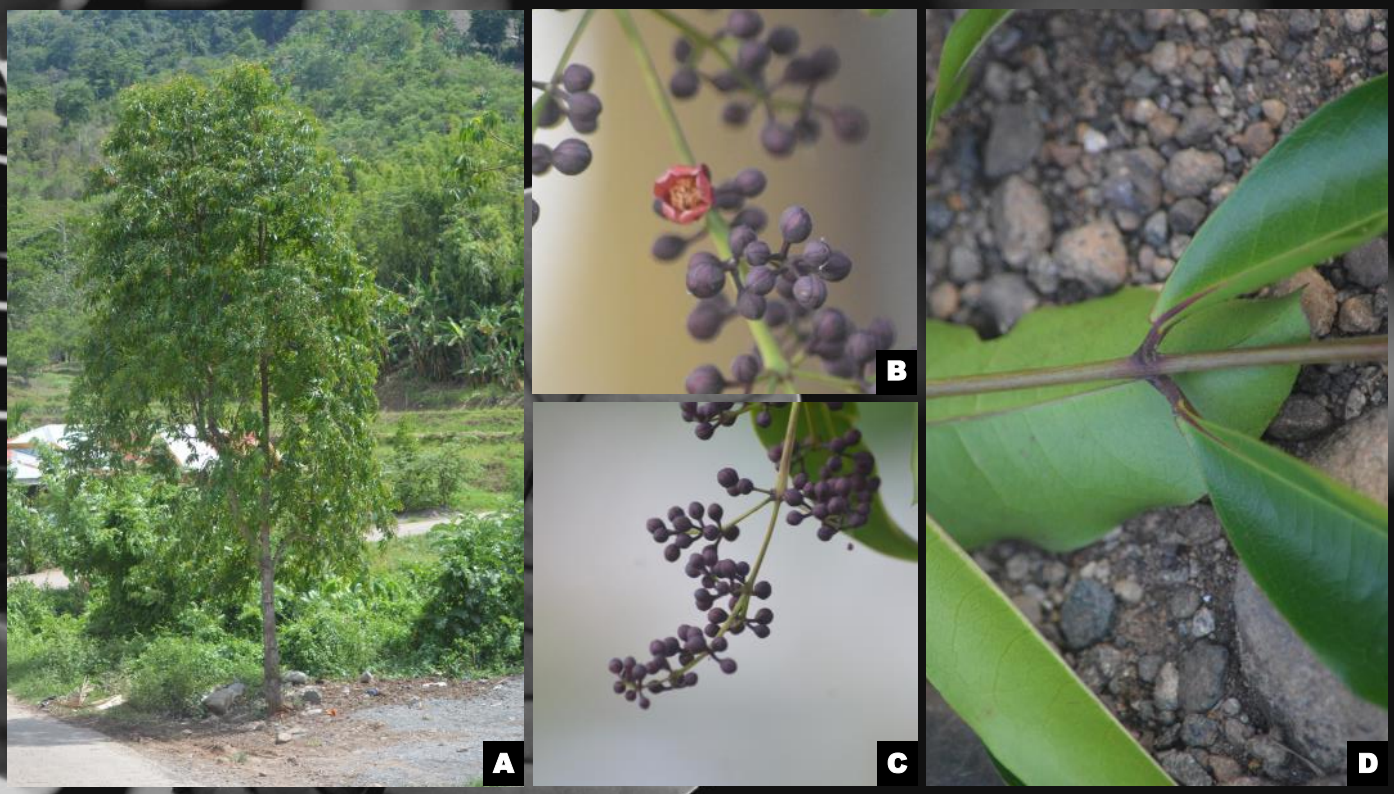
Where to find — In humid tropics, growing best in lowland areas below 650 meters, though also succeeding at elevations up to 1,550 meters.

Salingogon

Cratoxylum formosum (Jack) Dyer

Salingogon

Cratoxylum formosum (Jack) Dyer — *Clusiaceae* (Garcinia family)



A. Habit of mature tree. **B.** Profile of flower. **C.** Immature inflorescence. **D.** Profile of base / leaf attachment.

Year first Described	1874	**Timber Classification**	Lesser Used Species (LUS)
Vernacular Name/s	Salinggogon (Tagalog); Mango-gong, Marangguub, Salingagon (Palawan); Galiwgiwon (Tuwali);	**Conservation Status**	CR EN VU CD NT LC DD Least Concern (IUCN 2.3)
Distribution	Dingasan, Calaocan, Jose Ancheta, Balligui	**Propagation**	Seed, hardwood cutting

Notable features: **A medium-sized** to large deciduous tree up to 45 m tall; Bark surface papery scaly, grey-brown to red-brown or purplish in color; **Leaves** are elliptical or lanceolate to ovate or obovate; pale-green, powdery, with soft superficial gland; **Flowers** has white or pink to red or rarely purplish petals, with an entire nectary scale at base; **Fruits** are dark-brow in color.

Uses: **Wood** (very hard and durable) for indoor construction, charcoal; **Bark** for brown colored dye; **Young shoots** for cooking (vegetable).

Where to find: In undisturbed mixed dipterocarp to secondary forest, keranga, (peat)-swamp, mangrove and coastal forests up to 600(-1200) m altitude. Mostly on alluvial sites, but also on hillsides and ridges. On sandy to ultrabasic soils. Also in forest edges.

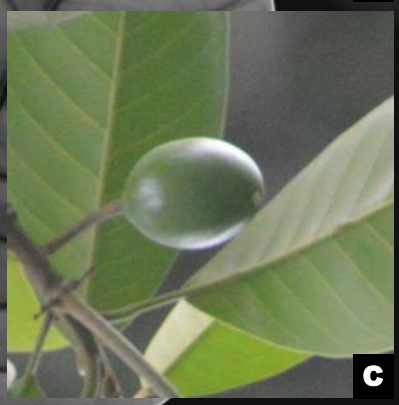
Tagotoi

Palaquium foxworthyi Merr.

Tagotoi

Palaquium foxworthyi Merr.

Sapotaceae (Sapodilla family)



A. Profile of mature leaf. **B.** Profile of bark (trunk). **C.** Fruit. **D.** Phyllotaxy or leaf arrangement.

Year first Described	1915	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Tagotoi (Tagalog); Bulon (Tuwali); Fulon, Falluha (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Not assessed
Distribution	Don Mariano Perez, Dingasan, Jose Ancheta	**Propagation**	Seed

Notable features **Evergreen tree** that can grow up to 45 m tall; **Leaves** are typically spirally arranged and often clustered near twig ends; **Flowers** are mostly bisexual, though some unisexual instances are known; **Fruits** are one or two-seeded with rare instances of several seeds.

Uses **Wood (soft to moderately hard)** for furniture and cabinet making, panelling, flooring, light carpentry, moulding and veneer; **Tree** is harvested from the wild for its wood, which is used locally and also traded under the name 'Nyatoh'.

Where to find: In coastal, lowland mixed dipterocarp, swamp and montane forests.

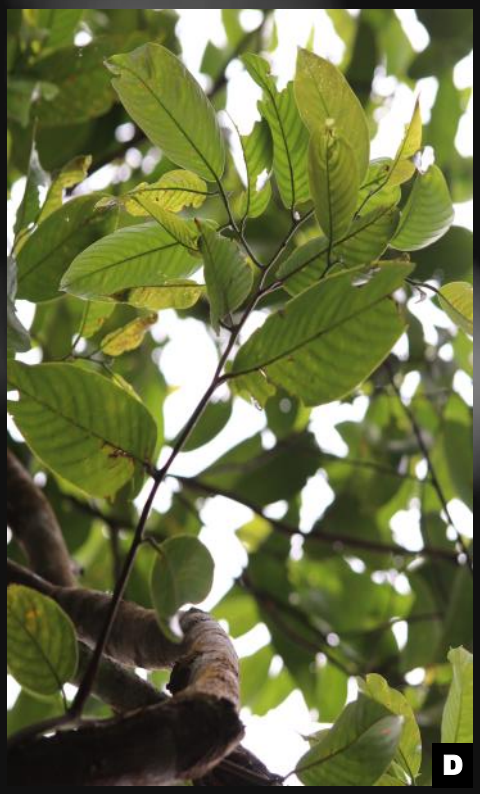
What's in a name? / Trivia *Palaquium* species have latex in sufficient amounts to make them commercially important in gutta-percha trade.

Tanguile

Shorea polysperma (Blanco) Merr.

Tanguile

Shorea polysperma (Blanco) Merr. ***Dipterocarpaceae*** (Dipterocarp family)



A. Profile of bark (trunk). **B.** Profile of juvenile. **C.** Profile of leaf and shoot. **D.** Phyllotaxy or leaf arrangement .

Year first Described	1905	**Timber Classification**	Philippine Mahogany group
Vernacular Name/s	Tangile (General); Fuhi (Ayangan)	**Conservation Status**	CR EN VU CD NT LC DD Critically Endangered (IUCN 2.3) Vulnerable (DENR DAO 07-01)
Distribution	Dingasan, Baguio village, Jose Ancheta, Victoria, Eden, Don Mariano Perez San Manuel, Balligui	**Propagation**	Seed

Notable features **Evergreen tree growing** up to 50 m and above; **Bark** is almost flaking with deep cylindrical fissures and gray in color; **Leaves** are simple, alternate, ovate-lanceolate, shiny, upper sur face dark green, lower surface light green and base is rounded; **Flowers** are small and yellowish in color.

Uses **Wood** for furniture, cabinet work, carpentry, flooring, stairs, boxes and crates, veneer, plywood, planking and decking.

Where to find Occurs in hilly country in evergreen mixed dipterocarp forest up to 1500 m altitude.

Tuai

Bischofia javanica Blume

Tuai

Bischofia javanica Blume — ***Phyllanthaceae*** (Phyllanthus family)

A. Phyllotaxy or leaf arrangement. **B.** Profile of leaf. **C.** wildlings.

Year first Described	1874	**Timber Classification**	Furniture/Construction Hardwood
Vernacular Name/s	Bishopwood, Java cedar (English); Tuai (Tagalog); Tuwwo (Ayangna); Tuwwol (Tuwali)	**Conservation Status**	CR EN VU CD **NT** LC DD Not threatened
Distribution	Evenly distributed throughout the landscape.	**Propagation**	Seed, wildling, stem cuttings

Notable features: **A medium to fairly large, deciduous tree** (30-50 m) tall; **Bark** fissured and scaly with small, thick shaggy scales, reddish-brown to purplish-brown in color; **Leaves** are arranged spirally, margin finely crenate-serrate, pinnately veined, and shiny above; **Flowers** are showy, greenish- yellow with no petals; **Fruit** is a globose drupe and bluish-black in color.

Uses: **Wood** for general construction, beams, posts, decking, flooring, veneer, and plywood; **Young soft leaves** are cooked and eaten as a vegetable; **Tree** is a potential source of long fibers for pulp and paper production.

Where to find: Scattered in primary and old secondary dry and deciduous forest or monsoon forest but also in evergreen forest, swamp and teak forest, sometimes in more open places like savannah tracts, especially on riverbanks and shady ravines .

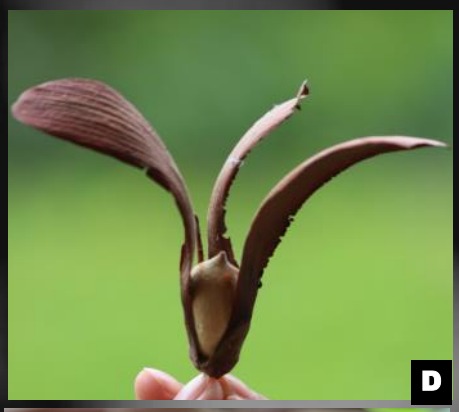
White lauan

Shorea contorta S. Vidal

White lauan

Shorea contorta S. Vidal

Dipterocarpaceae (Dipterocarp family)



A. Habit of mature tree. **B.** Profile of young leaves. **C.** Profile of mature leaf. **D.** Profile of seed **E. Seedling.**

Year first Described	1883	**Timber Classification**	Philippine Mahogany group
Vernacular/ Local Name/s	Hagnit (Bicol); Anas, Apait, Kakulau, (Iloko); Bayukan (Tuwali); Fuju-an (Ayangan	**Conservation Status**	CR EN VU CD NT LC DD Critically Endangered (IUCN 2.3) Vulnerable (DENR DAO 07-01)
Distribution	Don Mariano Perez, Eden, Dingasan, Jose Ancheta, Victoria, Ifugao Village, Calaocan, San Manuel	**Propagation**	Seed, wildlings, cuttings

Notable features: **A large evergreen tree** (~50 m tall); **Trunk** erect, cylindrical and buttressed when mature; **Bark** is grey, fissured and flaky outside; pinkish inside; **Leaves** are leathery, whitish-green, with faint spots.

Uses: **Wood** is great material for plywood, veneer, furniture, light and heavy construction; **Yield resin** used as illuminant and for caulking boats.

Where to find: Found in the ever-decreasing lowland seasonal semi-evergreen dipterocarp forest at elevation up to 700 m.

Participatory Forest Assessment Team

On-the-Job Training of the Participatory Forest Assessment Team

Field Activity

References

Adinortey, M. B., I. K. Galyuon, and N. O. Asamoah (2013). Trema orientalis Linn. Bume: A Potential for Prospecting for Drugs for Various Uses. Phcog Rev 2013;7:67-72

Administrative Order No. 80, 1987. Regulations Governing the Measurement, Assessment and Payment of Forest Charges on Timber and Other Forest Products

Appanah, S., J. M. Turnbull, and Center for International Forestry Research. (1998). A Review of Dipterocarps: Taxonomy, ecology and silviculture. Bogor, Indonesia: Center for International Forestry Research

A Taxonomic, phylogenetic and Biogeograhic study of the genus Acanthophora (Rhodomelaceae). S. D. M. de Jong Creusa Hitipeuw and Willem, F. Prud'homme van Reine Blumea 44 (1999). 217-249.

Asclepiadeae 64. 1810 (Mem. Wern. Nat. Hist. Soc. 1:75. 1811)

Asamoah, A., Atta-Boateng, A., Antwi-Boasiako, C., and K. Frimpong-Mensah. (2012). PROTA 7(2): Timbers 2/ Instia bijuga. Plant Resources of Tropical Africa. Timbers 2

Balgooy, M. M. J. (1997-2001). Malesian Seed Plants. Vols. 1-3. Rijksherbarium/Hortus Botanicus, Leiden, The Netherlands.

Cadiz, R. T., Modino, R. C., and S. C. Almario. (1991). Reforestation Species. Research Information Series on Ecosystem. Vol. 3 (4).

Corlett, R.T. & Lafrankie, J.V. Climatic Change (1998) 39: 439. https://doi.org/10.1023/A:1005328124567 https://business.mb.com.ph/2018/02/07/why-native-trees/

de Kok, R. 2020. *Vitex parviflora*. *The IUCN Red List of Threatened Species* 2020: e.T33339A67741355. https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T33339A67741355.en. Downloaded on 10 May 2020.

DENR Administrative Order No. 42, August 22, 1991

Djuita, N. R., Hartana, A., Chikmawati, T., and D. Dorly. (2016). Pulasan [(Nephelium ramboutan-ake (Labill.) Leenh.] fruit trees: variations in flower morphology, and associated differences in pollination type. International Journal of Plant Biology. 7.10.4081. Available from: http://doi.org/10.4081/pb.2016.6149

Ella, A. B. and E. P. Domingo. Almaciga (Agathis philippinensis Warb.) Valuable but Endangered Forest Tree Species in the Philippines. FPRDI – DOST, College, Laguna.

Fernando E.S., Sun, B.Y., Suh, M.H., Kong, H.Y., and Koh, KS. 2004. Flowering Plants of Mt. Makiling. Asean-Korea Environmental Cooperation. Seoul National University, South Korea.

Fisher, J. B. (2002). Indeterminate leaves of Chosocheton (Meliaceae): survey of structure and development, Botanical Journal of the Linnean Society. Vol. 139 (2). 207 – 221 pp. Available from: https://doi.org/10.1046/j.1095-8339.2002.00050.x

Gangwar, M., Goel, R., and G. Nath. (2014). Mallotus philippinensis Muell. Arg (Euphorbiaceae): Ethnopharmacology and Phytochemistry Review. BioMed Research International 2014 (3):213973

Gilman, E. F., and D. Watson. (1998). Lagerstroemia speciose: Queens Crapemyrtle

Guingab, M. V. D. (2012). Plant Diversity and Conservation Status of the Isabela State University Wildlife Sanctuary.

Kalaria, P. and Gheewala, P. and Chakraborty, Manodeep and Kamath, Jagadish. 2012. A Phytopharmalogical Review of Alstonia scholaris: A panoramic herbal medicine. International; Journal of Research in Ayurveda and Pharmacy. 3. 367 – 371.

Langenberger, G. (2006). Habitat distribution of dipterocarp species in the Leyte Cordillera: an indicator for species – site suitability in local reforestation programs. Ann. For. Sci. 63. 149 – 156. Available from: http:// www.edpsciences.org/forest

Lantican, C. B. (2015). Philippine Native Trees – What to Plant in Different Provinces. Available online: http:// www.pcaarrd.dost.gov.ph/home/momentum/wood/resources/Philippine%20Native%20Trees.pdf-DrCBLantican-30jan2015.pdf

Leenhouts, P. W. (1986). A Taxonomic Revision of Nephelium (Sapindaceae). Blumea Vol. 31 (2). 373 – 436 pp.

Morton, J. 1987. Fruits of warm climates. Creative Resource Systems, Inc. 210–212 pp.

Mrunal, K., Shirsat, G., and A. Jeyabalan. (2018). A review of Lagerstroemia speciose: Pride in India. International Journal of Contemporary Research and Review, 9 (10), 20181-20185.

Nickrent, D. L., Costea, M., Barcelona, J. F., Pelser, P. B. and K. Nixon. 2006 onwards phytoimages. Available from: http://www.phytoimages.siu.edu

Orwa, C., Mutua, A., Kindt, R., Jamnadass, R., and A. Simons. (2009). ORWA et al. pdf. Agroforestree database: a tree reference and section guide version.4.

Pelser, P. B., Barcelona, J. F., and D. L. Nickrent (eds.). 2011 onwards. Co's Digital Flora of the Philippines. Available from: http://www/philippineplants.org

Philippine Native Trees 101 Up Close and Personal. ABS-CBN Publishing, Inc. 2012.

Philippine Native Trees 102 Up Close and Personal. ABS-CBN Publishing, Inc. 2015.

Pratap, B., Chakraborthy, G. S., and N. Mogha. (2013). Complete Aspects of Alstonia Scholaris. International Journal of PharmTech Research. Vol. 5 (1). 17 – 26 pp.

Presidential Decree 705, Revised Forestry Code of the Philippines

Presidential Decree No. 1559, Further Amending PD No. 705, or the Revised Forestry Code of the Philippines

PROSEA (various editors). (1989-1998). Plant Resources of South-East Asia. Backhuys Publishers, Leiden.

PROSEA Foundation. (1989-1993). Plant Resources of South East Asia. Wageningen Agricultural University. The Netherlands. Published in J. Linn. Soc., Bot. 21: 307 1884.

Quisumbing, E. A. (1978). Medicinal Plants of the Philippines. Katha Publishing Co. Quezon City, Philippines. iv, 1262 pp.

Ragasa, C. Y., Batarra, T. C., Vivar, J. L. A., De Los Reyes, M. M, and C. C. Shen. (2017). Chemical Constituents of Dracontomelon Dao (Blanco) Merr. Et Rolfe. Vol. 9 (5), 654 -656 pp.

Rastogi, S., Kulshreshtha, D., and A. Rawat. (2006). Sterblus asper Lour. (Shakhotaka): A Review of its Chemical, Pharmacological, and Ethnomedicinal Properties. Evidence-based complementary and alternative medicine: eCAM. 3. 217 – 22. 10.1093/ecam/ne1018

Republic Act No. 9147 ""Wildlife Resources Conservation and Protection Act"

Riany, F., Siregar, I. Z., and D. J. Sudrajat. (2018). The Growth and Genetic potentials of gempol (Nauclea orientalis L.) as shading trees in Urban Landscapes. IOP Conference Series: Earth and Environmental Science. 203 (1)

Rise Volume 30 No.1 Balobo diplodiscus paniculatus Turcz. (2018). ERDB, College, Laguna

Rojo, J. P. (1999). Revised Lexicon of Philippine Trees. FPRDI, College, Laguna.

Rojo, J. P. and E. G. Aragones. (1997). Botanical Identification Handbook on Philippine Dipterocarps. FPRDI, College, Laguna.

Roy, S. S., Kumar, S., Sharma, S., Devi, A. R., Singh, N. A., Prakash, N., and Ngachan, S. V. (2016). Tree Bean (Parkia roxburghii): A Potential Multipurpose Tree Legume of North East India.

Sharman, J., and R. Varmal. (2011). A Review on Endangered plant of Mallotus philippinensis (Lam.) M. Arg. Pharmacologyonline 3: 1256 – 1265

Shaikh, S., M. Gokhale and N. Chavan. (2011). A report on the existence of Heretiera Littoralis Dryland on the coast of Maharashtra. 6. 293 – 295.

Species 2000 and IT IS Catalogue of Life: 2019

Stephen, A. (2012). Syzygium cumini (L.) Skeels: A multipurpose tree, its phytotherapic and pharmacological uses. Journal of Phytotherapy and Pharmacology. 1. 22-32.

Syzygium simile (Merrill) Merrill in S. Taiwan, Hengchun Tropical Garden. (2013). Publication in Philipp. J. Sci. 79: 414. (1951)

Tamesis, F. 1948. Philippine Forests and Forestry. Unasylva. Vol. 2, No. 6. Food and Agriculture Organization of the United Nations.

Tarriela, Flor G. "Why Native Trees?" *Green Convergence For Safe Food, Healthy Environment and Sustainable Economy*, 7 Feb. 2018, greenconvergencephil.com/why-native-trees/.

The Herbarium Catalogue, Royal Botanic Gardens, Kew. Available at https://kew.org./herbcat

The Plant List (2013) version 1.1. Published on the internet: http://www.theplantlist.org

Tropical Plants Database, Ken Fern. Tropical. The Ferns. Info. 2019

Ungson, L. B., and G. G. (2002). Tissue culture of Broussonetia luzonica. Asia Life Sciences. 11(1): 59 – 71.

Ungson, L. B. (2011). Character variation in Terminalia microcarpa Decne.: morphology and phenology of mature trees and early seedling growth. Asian International Journal Life of Sciences. 10 (1): 45 –54.

Uy, M. M., and M. G. L. Villazorda. (2015). The antioxidant properties of the Philippine medicinal plants Cassia sophera Linn., Derris elliptica Benth, Ficus minahassea Tesym. and De Vr., Leea aculeate Blume and Leucosyke capitellata Wedd. AAB Bioflux 7(3):150-156.

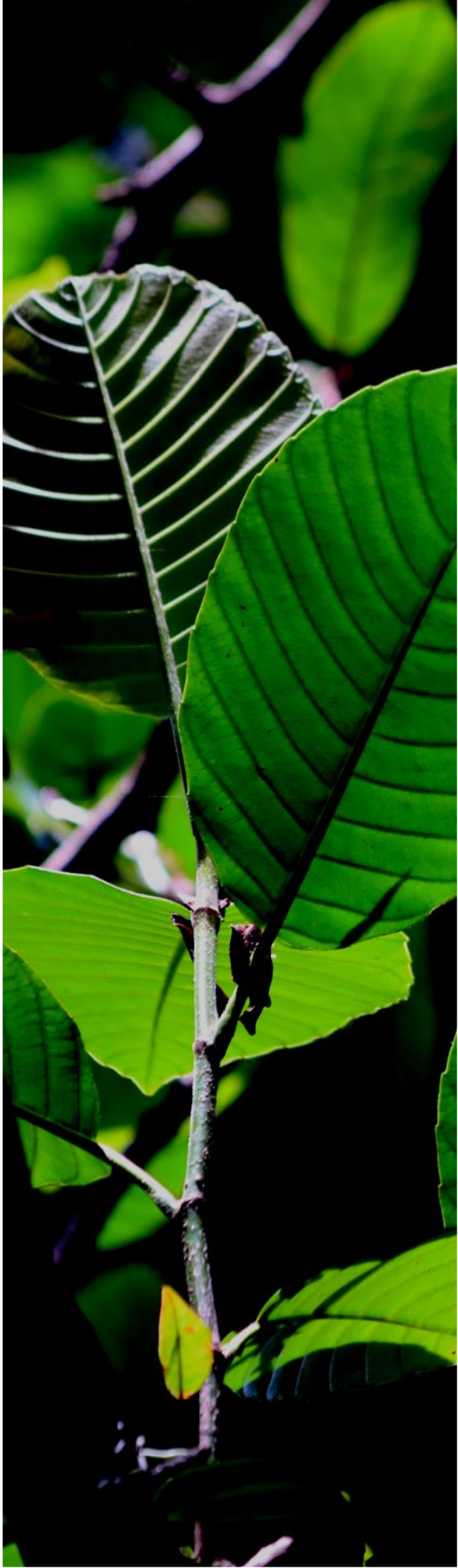
Van Welzen, P. C., Ning, K., Eviyarni, T., and F. J. M. Gaerlan. (1999). The Malesian species of Melanolepis (Euphorbiaceae). Blumea Vol. 44 (2). 437 – 446

Warrier, Rekha. (2011). Melia Dubia

Wulandini, R., Widyani, N., Harum, F. (Ed.), Schidmt, L. H. (Ed.), and Joker, D. (Ed.). (2004). Octomeles sumatrana Miq. Seed Leaflet, (102).

Dao I GreeninPhilippines – RAFI.org.ph Downloaded from rafi.org.ph/greenunphilippines/green0almanac/dao/ on October 22, 2016

pinoynegosyo.blogspot.com/2006/producction of almaciga. Available from: http://
ecop.ploworks.com/w/page
https://www.tropicaltimber.info
https://www.Plants.jstor.org
https://www.itto.org
https://ngp.denr.gov.ph
https://www.worldagroforestry.org
https://www.stuartxchange.com
https://agris.fao.org
https://www.inaturalist.org
https://www.lesserknowntimberspecies.com
http://www.pcaarrd.dost.gov.ph
http://www.stuartxchange.org/Molave
https://link.springer.com/chapter/10.1007/978-94-007-1764-0_54
https://ipni.org/
https://www.asianplant.net
https://binhi.ph/database
https://ntfp.org/2016
https://florafaunaweb.nparks.gov.sg
https://www.philippineplants.org
https://projectnoah.com
https://www.monaconatureencyclopedia.com
https://iucnredlist.org
https://www.erdb.denr.gov.ph
https://pfaf.org/user/plant
https://efloras.org
https://checklist.org.br
https://the treedictionary.com
https://gbif.org
http://www.tropicaltimber.info/specie/vitex-vitex-parviflora/
https://rainforestrestorationinitiative.wordpress.com/
http://tropical.theferns.info/viewtropical.php?id=Vitex+parviflora
https://www.cropsreview.com/vitex-parviflora.html
https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species
https://www.iucn.org/downloads/en_iucn__glossary_definitions.pdf
forestry.usu.edu/trees-cities-towns/tree-selection/native-trees#:~:text=By%20definition%2C%20a%20"native",naturally%20in%20a%20particular%20region.&text=The%20focus%20in%20using%20native,where%20they%20will%20be%20planted.
https://rainforests.mongabay.com/0103.htm
http://www.fao.org/3/q9270E/q9270e00.htm#Contents
https://www.merriam-webster.com/dictionary/undergrowth
http://www.fao.org/3/ap862e/ap862e00.pdf
https://www.merriam-webster.com/dictionary/wood
https://www.avianreport.com/tropical-lowland-evergreen-forest
http://www.bmb.gov.ph/index.php/e-library/laws-and-policies/denr-administrative-orders/dao-2007-2016?start=20



Forest Foundation Philippines

Let's grow together.