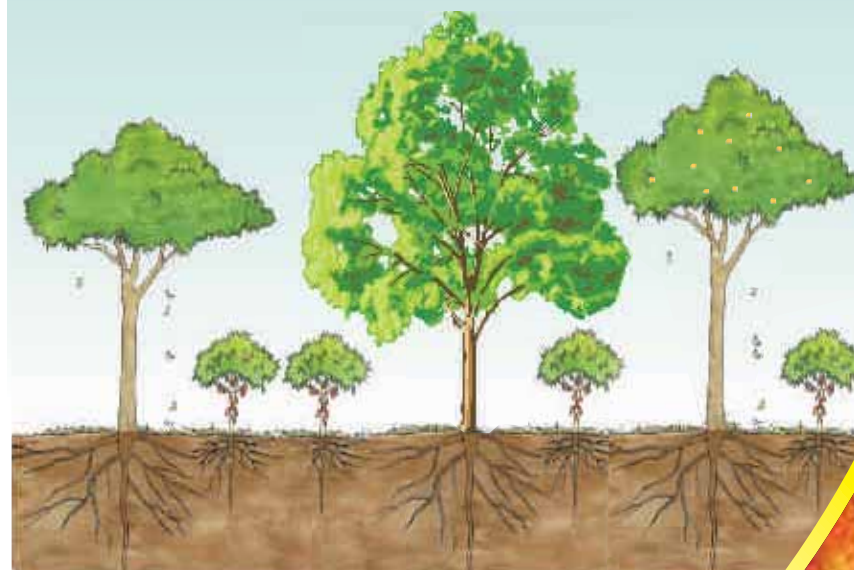


Shade tree guide

for Ghanaian cocoa farmers



Tijmen Hoogendijk
Denise Dahrs
2012



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November 2012

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TABLE OF CONTENTS

Introduction	4
How to use the field guide	5 - 9
DESIRABLE TREE SPECIES	
Emire	10 - 11
Odum	12 - 13
Ofram / Framo	14 - 15
Nyamedua	16 - 17
Otie	18 - 19
Edinam	20 - 21
Sapele	22 - 23
Baku / Makore	24 - 25
Krumben / Mahogany <i>sp.1</i>	26 - 27
Kruba / Mahogany <i>sp.2</i>	28 - 29
Dubini / Mahogany <i>sp.3</i>	30 - 31
Utile	32 - 33
UNDESIRABLE TREE SPECIES	
Odwuma	34 - 35
Nyankuma	36 - 37
Osonkrobia	38 - 39
Sua-Bese / Kwakuo-Bese	40 - 41
Watapuo	42 - 43
Index - Tree Species	44
References	45

INTRODUCTION

Traditional shade grown cocoa field guide systems have undergone a transition after the promotion of non-shaded and more intensively managed cocoa plantations. Large areas of tropical forests have been cleared to support the increasing cocoa production, resulting in one of the highest deforestation rates in Africa (Gyampoh, A.B., 2011). The unsustainable production of cocoa beans leads to more vulnerable trees that need more and more chemical fertilizers and pesticides to survive. Most farmers are not able to buy enough fertilizers or pesticides to keep the production of cocoa high. Nearly a third of the crops is destroyed each year due to pest and disease pressure, meaning a total loss of \$1.0 billion annually and it decreases the lifetime of cocoa trees dramatically (Beer, J., e.a., 1988). What for? Farmers used to grow cocoa in shade tree field guide systems in the past by using beneficial trees for the cocoa plants as well as for the farmer (Gyampoh, A.B., 2011). Standards for sustainable cocoa production under shady circumstances are set by different certification organizations and more and more farmers have become aware of the advantages of shade trees on cocoa plantation during trainings. Many cocoa farmers are willing to plant shade trees on their cocoa farm (Hoogendijk, T., 2012). The purpose of this field guide is to show farmers which tree species are found most desirable or undesirable, for what purposes the tree can be used or why they are found undesirable. Chapter 1 gives a detailed description of all the information that is included per tree species in the field guide. The tree species that are included in the field guide are the result of the bachelor thesis research of T. Hoogendijk (2012). The research has combined the answers of almost 200 farmers that were interviewed individually and in focus groups, the list of desirable and undesirable tree species from the Cocoa Research Institute Ghana (CRIG) and two other literature sources (Asare, R., 2006 and Anglaaere, L.C.N., 2005).

HOW TO USE THE FIELD GUIDE

The field guide was set up to provide information about the desirable and undesirable tree species. Icons are used to transfer the information with clarity. This chapter describes what information is included for the desirable and undesirable tree species and explains the meaning of the different icons and how you should read it.

Desirable tree species	Undesirable tree species												
<p>Local name: Scientific name:</p> <ul style="list-style-type: none"> - General tree info <table border="1"> <tr> <td>Tree branchless to</td> <td>... m</td> </tr> <tr> <td>Max diameter at breast height</td> <td>... cm</td> </tr> <tr> <td>Maximum tree height</td> <td>... m</td> </tr> </table> - Tree drops leaves (and when) or evergreen - How to stimulate germination of tree seeds - When to transplant seeds into the field - Time of flowering / fruiting - Uses <p>- Pictures to identify the tree in the field</p>	Tree branchless to	... m	Max diameter at breast height	... cm	Maximum tree height	... m	<p>Local name: Scientific name:</p> <ul style="list-style-type: none"> - General tree info <table border="1"> <tr> <td>Tree branchless to</td> <td>... m</td> </tr> <tr> <td>Max diameter at breast height</td> <td>... cm</td> </tr> <tr> <td>Maximum tree height</td> <td>... m</td> </tr> </table> - Tree drops leaves (and when) or evergreen - Uses - Why undesirable <p>- Pictures to identify the tree in the field</p>	Tree branchless to	... m	Max diameter at breast height	... cm	Maximum tree height	... m
Tree branchless to	... m												
Max diameter at breast height	... cm												
Maximum tree height	... m												
Tree branchless to	... m												
Max diameter at breast height	... cm												
Maximum tree height	... m												

Figure 1: List of information that is included per desirable and undesirable tree species

GENERAL INFORMATION ABOUT THE TREE:

Local name:
Scientific name:
Local name:
Scientific name:

The local and scientific name are given for each tree species. The colour of the textbox and the frame around the pages indicates whether it is a desirable or an undesirable tree species. Green means desirable and red means undesirable.

Tree branchless to	... m
Max diameter at breast height	... cm
Maximum tree height	... m

This table provides information about the maximum diameter at breast height (centimetres) and height (metres) the tree can reach. It also tells you at what height the branches start (metres).

TREE DROPS ITS LEAVES OR IS EVERGREEN



Deciduous trees drop their leaves once or several times in a year. The months below the icon show when the tree drops its leaves.
e.g. (December - February)

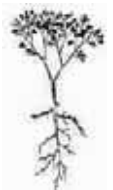


Evergreen tree that has leaves the whole year round

ROOT SYSTEMS



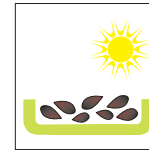
Shallow root system



Deep root systems



STIMULATION OF SEED GERMINATION:



Dry seeds in the sun



x5



Soak seeds in water

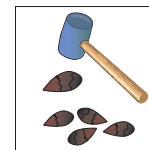


x1



Incision of seed coat

Cut the coat of the seed to allow water and light to reach the seed.



Cracking of seed coat

Crack the coat of the seed to allow water and light to reach the seed.

The clock under the icon shows the number of days the practice takes (e.g. x1 with 12 hrs icon means should be soaked overnight or x5 (24 hrs icon) means you have to dry or soak for 5 days).



> 12 months

TRANSPLANTING OF SEEDLING INTO THE FIELD

The information below the icon tells you after how many months or how tall it has to grow before you can transplant the seedlings into the field.



FLOWERING / FRUITING

Below you see two timelines that show all the months of the year (January – December). Some boxes of the timeline are grey which means that the tree flowers or bear fruits in those months.



USES OF TREE (POSTIVE CHARACTERISTICS)

The icons below show all the purposes which you can use the tree for.

Purposes of tree species:-



Timber



Furniture



Firewood



Medicine



Seed Oil



Animal fodder



Edible leaves



Edible fruits



WHY UNDESIRABLE (NEGATIVE CHARACTERISTICS)

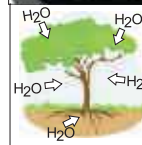
The icons below warn you of negative characteristics of the tree species that might harm your cocoa trees.



Host for cocoa swollen shoot virus



Too much shade



Tree competes for water



Leaves produce acidic soil

NOTE:

The following information will not be included for the undesirable tree species.

- Pre-germination methods
- Transplanting of seedling into the field
- Months when tree species flowers
- Months when tree species bears fruits

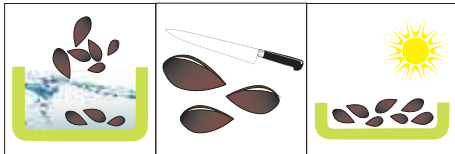
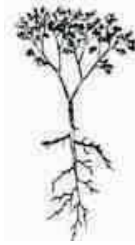


Local name: Emire
 Scientific name: *Terminalia ivorensis*



(Oct - Dec)

Tree branchless to	30 - 35 metres
Max diameter at breast height	120 - 170 cm
Maximum tree height	45 - 50 metres



x1

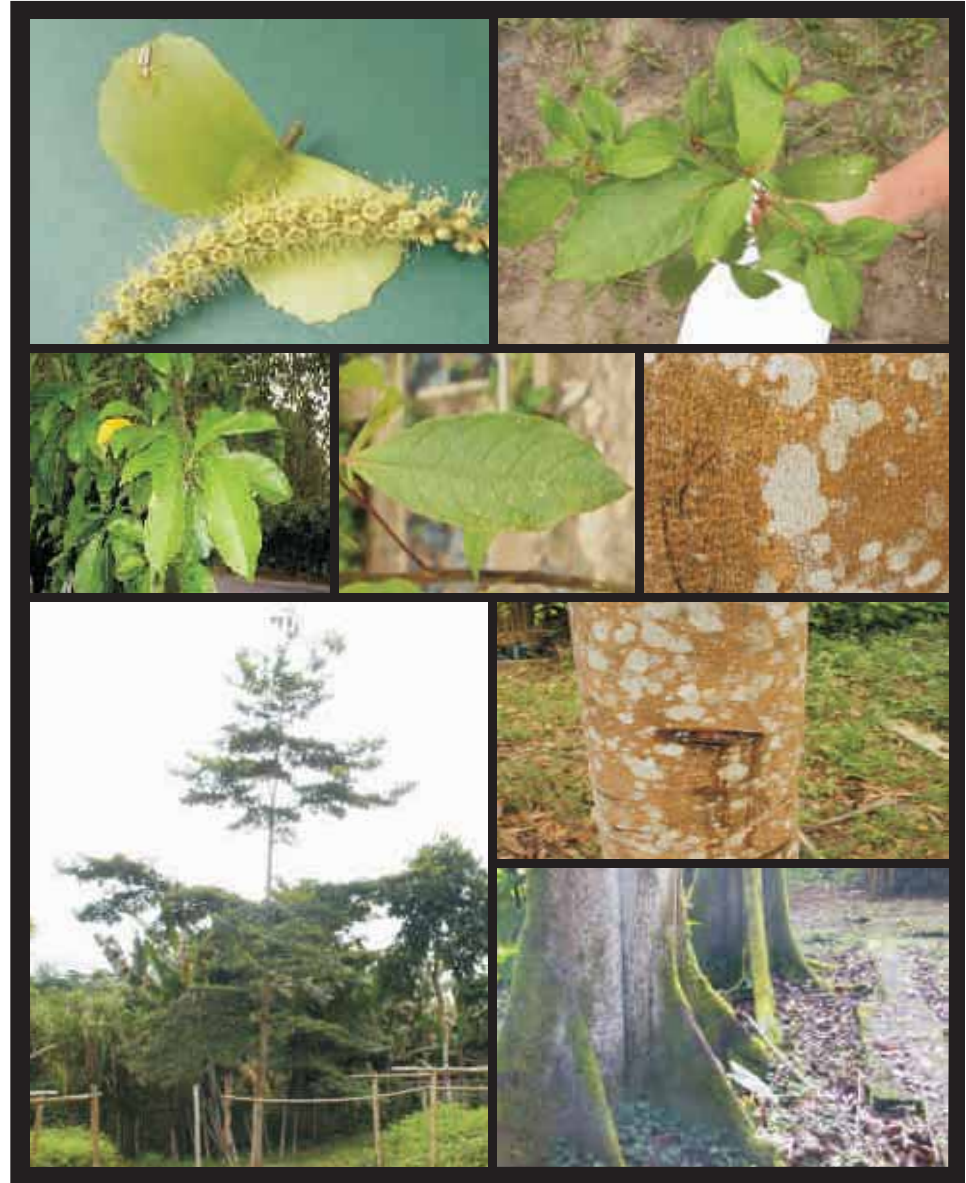


x7

20 - 30 cm tall



Emire



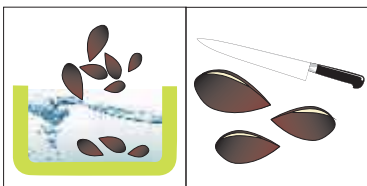


Local name: Odum
 Scientific name: *Milicia excelsa*



(Dry season)

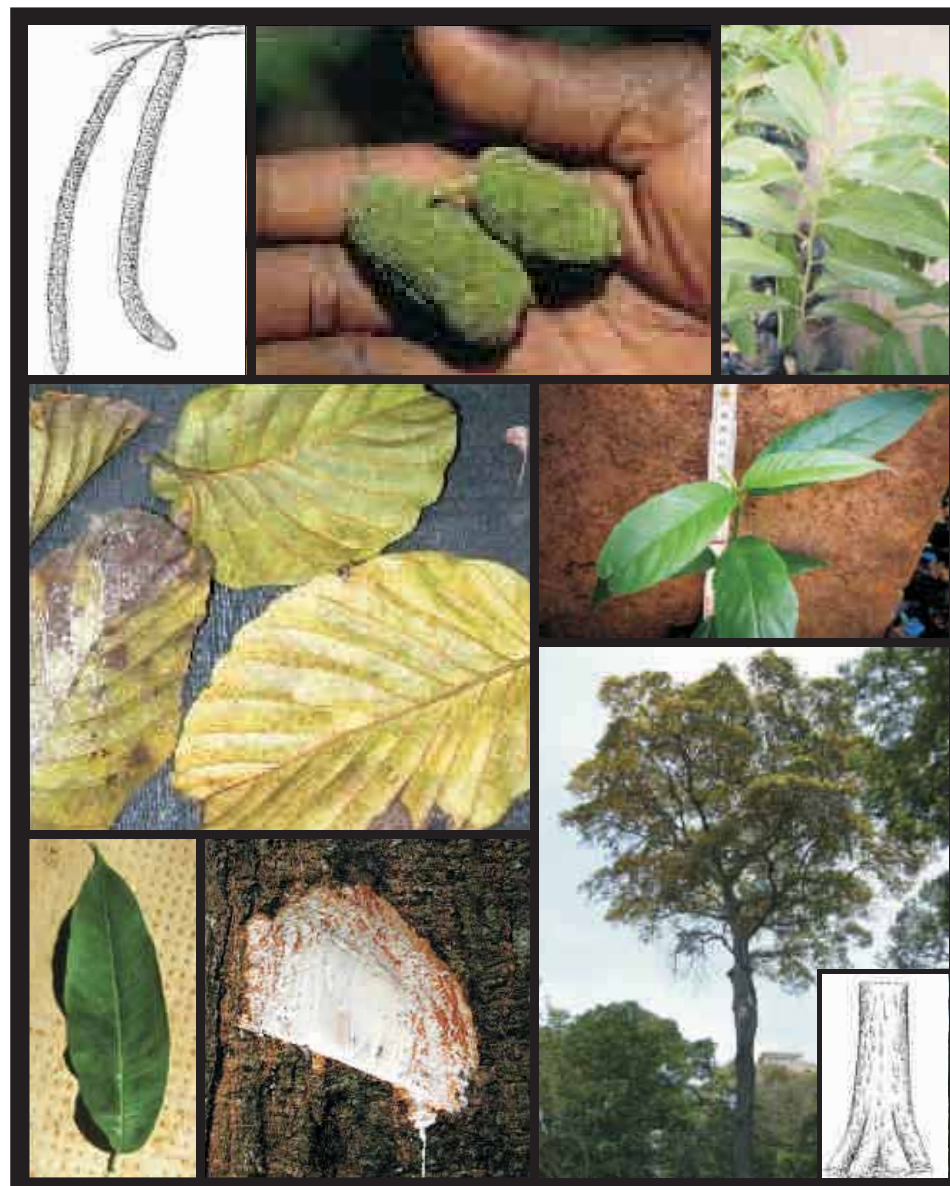
Tree branchless to	25 - 30 metres
Max diameter at breast height	250 - 300 cm
Maximum tree height	50 metres



> 4 months



Odum



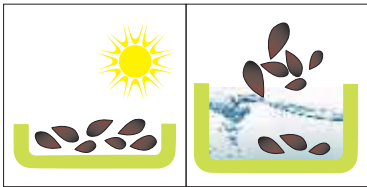


Local name: Ofram / Framo
 Scientific name: *Tieghemella heckelli*



(Dry season)

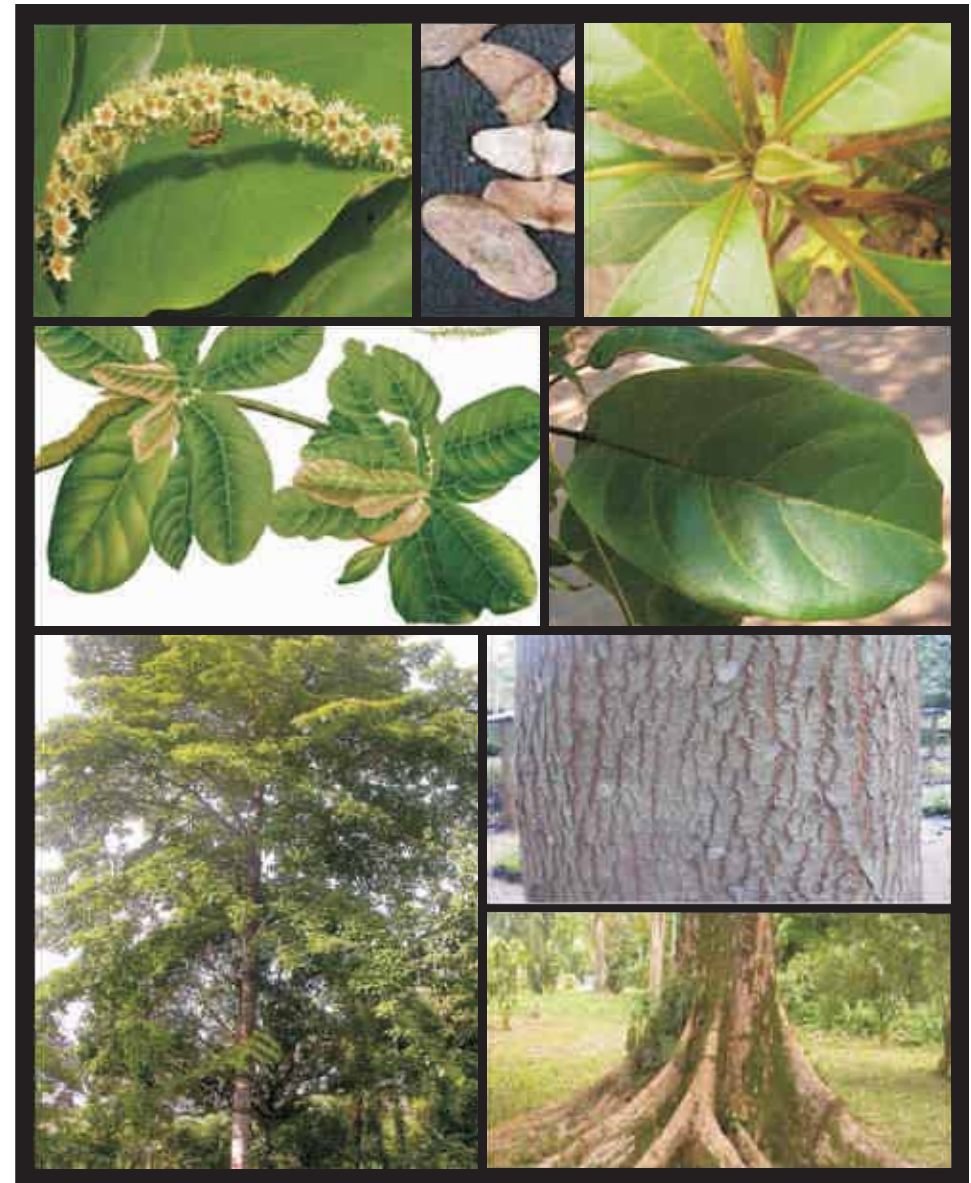
Tree branchless to	30 - 35 metres
Max diameter at breast height	120 - 150 cm
Maximum tree height	45 - 50 metres



> 12 months



Ofram / Framo





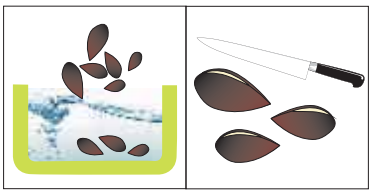
Local name: Nyamedua
Scientific name: *Alstonia boonei*



Tree branchless to	25 metres
Max diameter at breast height	100 - 140 cm
Maximum tree height	45 metres



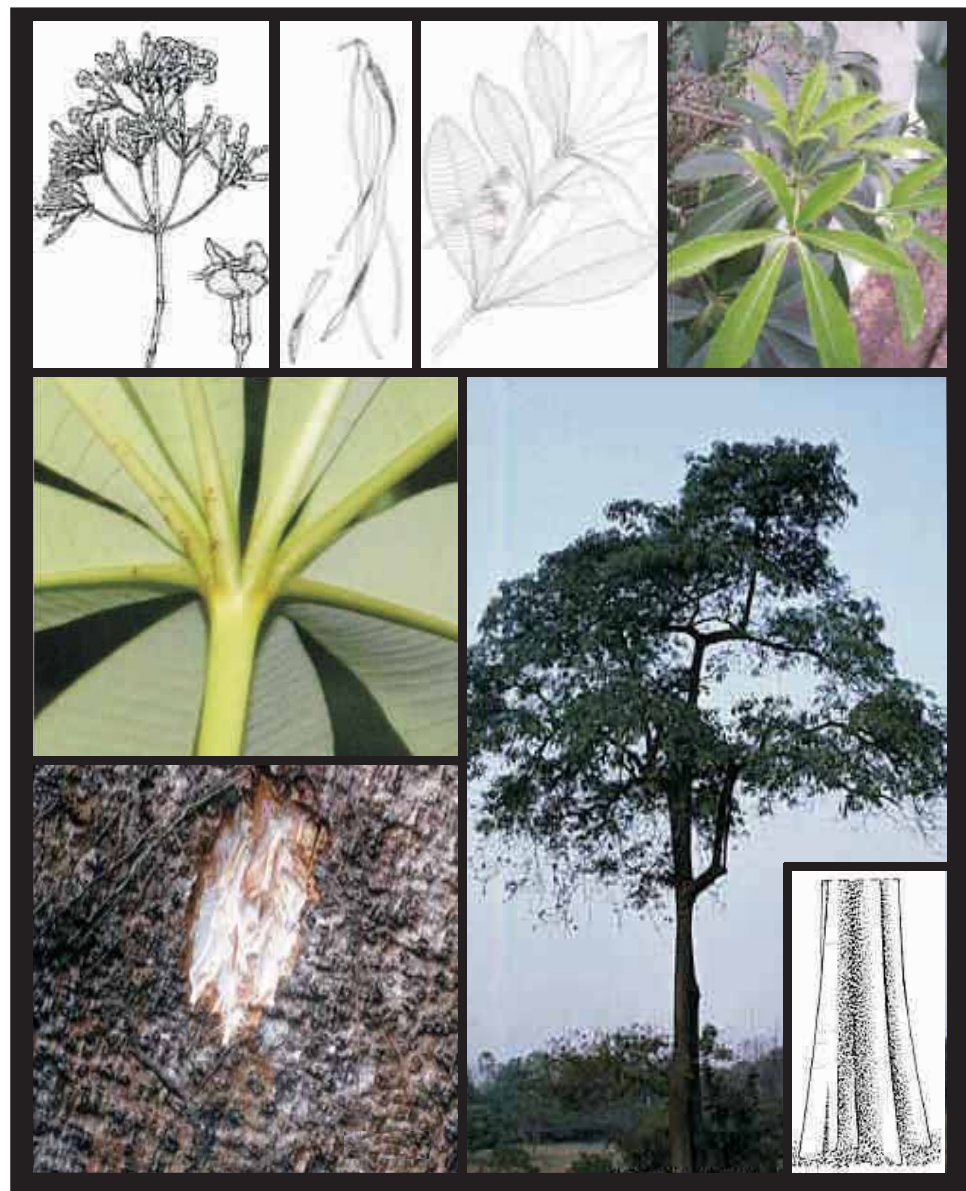
(End of rainy season)



> 6 months



Nyamedua

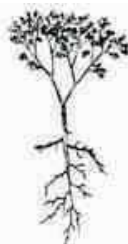




Local name: Otie
Scientific name: *Pycnanthus angolensis*



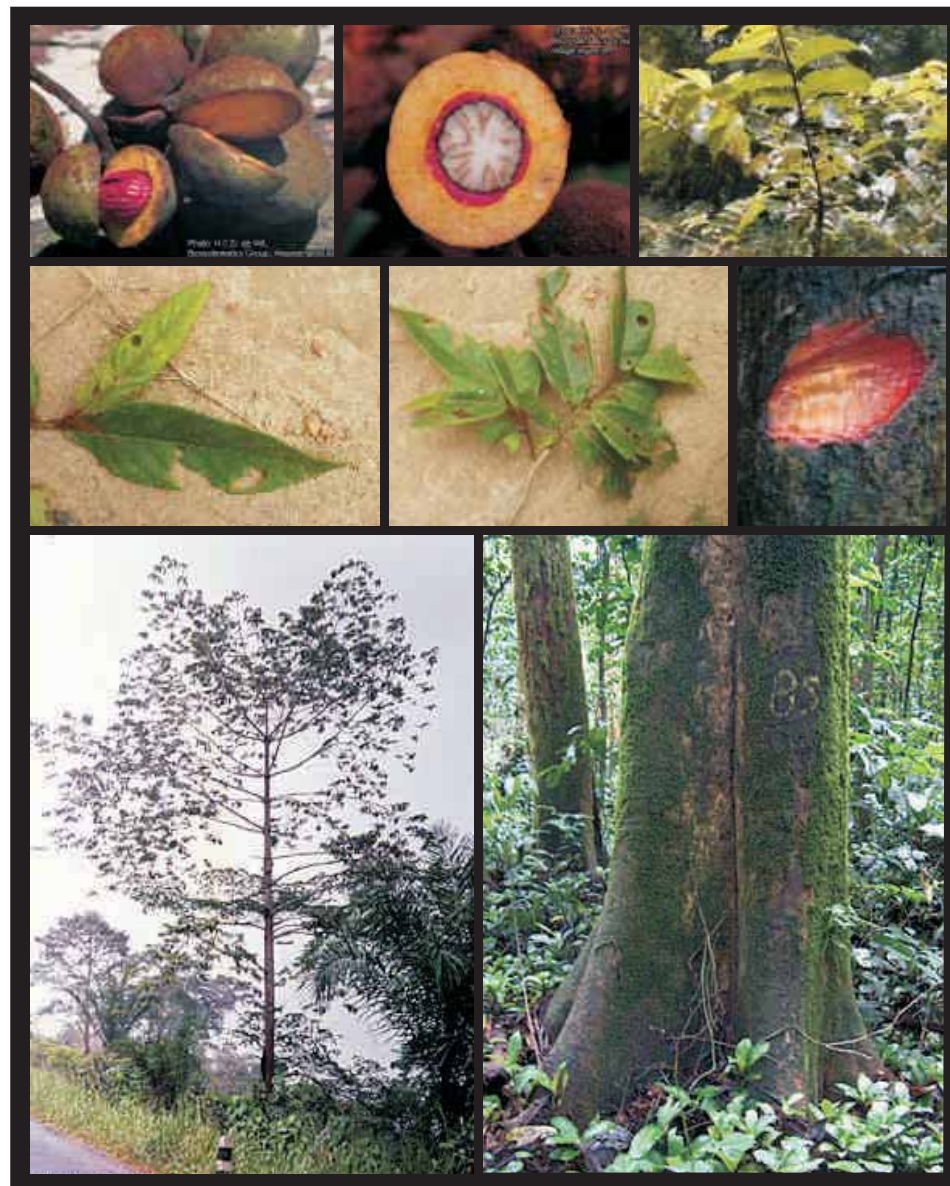
Tree branchless to	15 - 25 metres
Max diameter at breast height	120 - 150 cm
Maximum tree height	25 - 35 metres



12 - 24 months > 30 cm



Otie





Local name: Edinam

Scientific name: *Entandrophragma angolense*



(Dry Season)

Tree branchless to	30 - 40 metres
Max diameter at breast height	200 cm
Maximum tree height	50 - 60 metres



12 Hrs x1

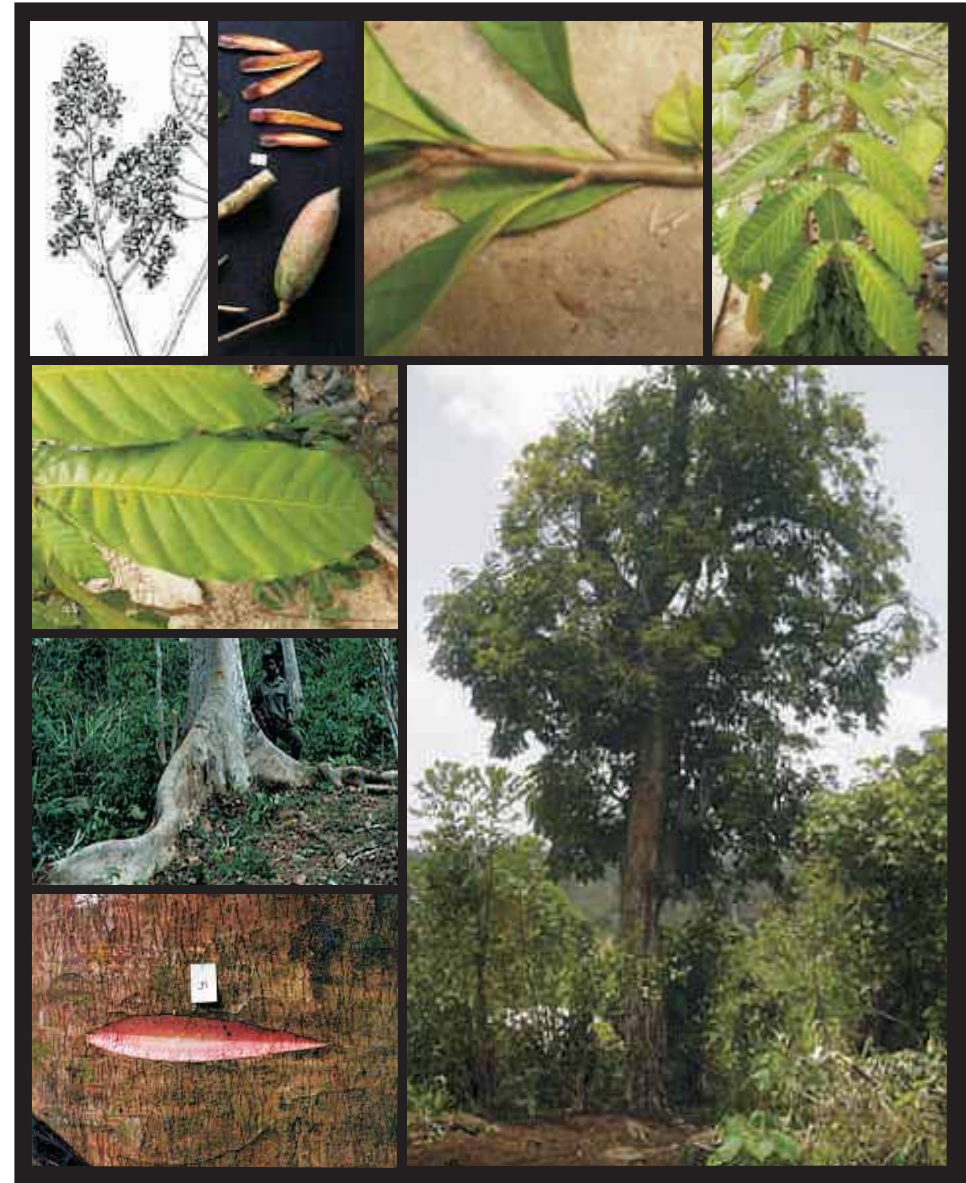
24 Hrs x1

> 6 months

Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

Edinam





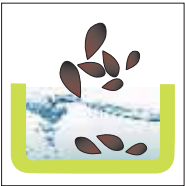
Local name: Sapele

Scientific name: *Entandrophragma cylindricum*



(Oct - Nov)

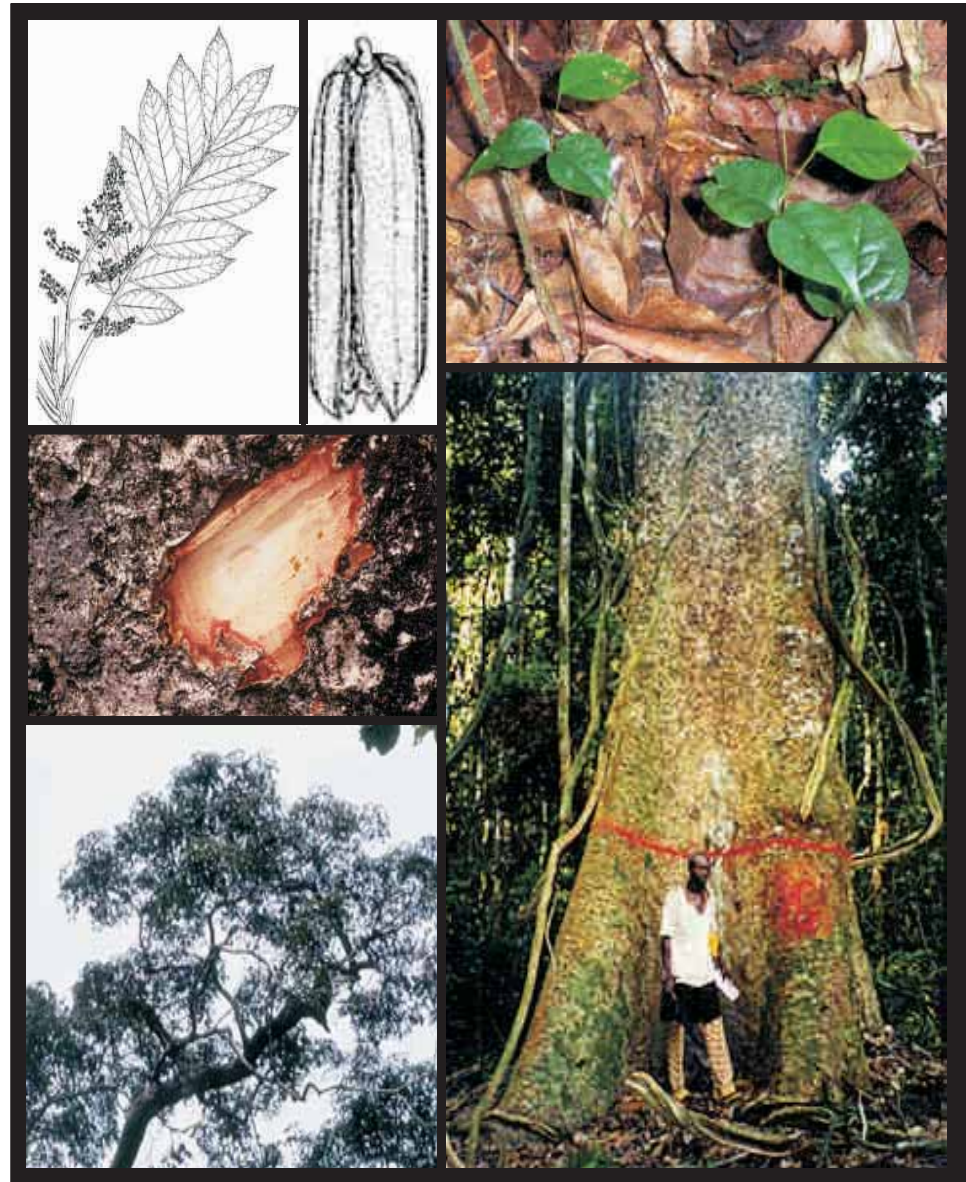
Tree branchless to	40 metres
Max diameter at breast height	200 - 250 cm
Maximum tree height	55 - 65 metres



> 6 months



Sapele





Local name: Baku / Makore
Scientific name: *Tieghemella heckelli*



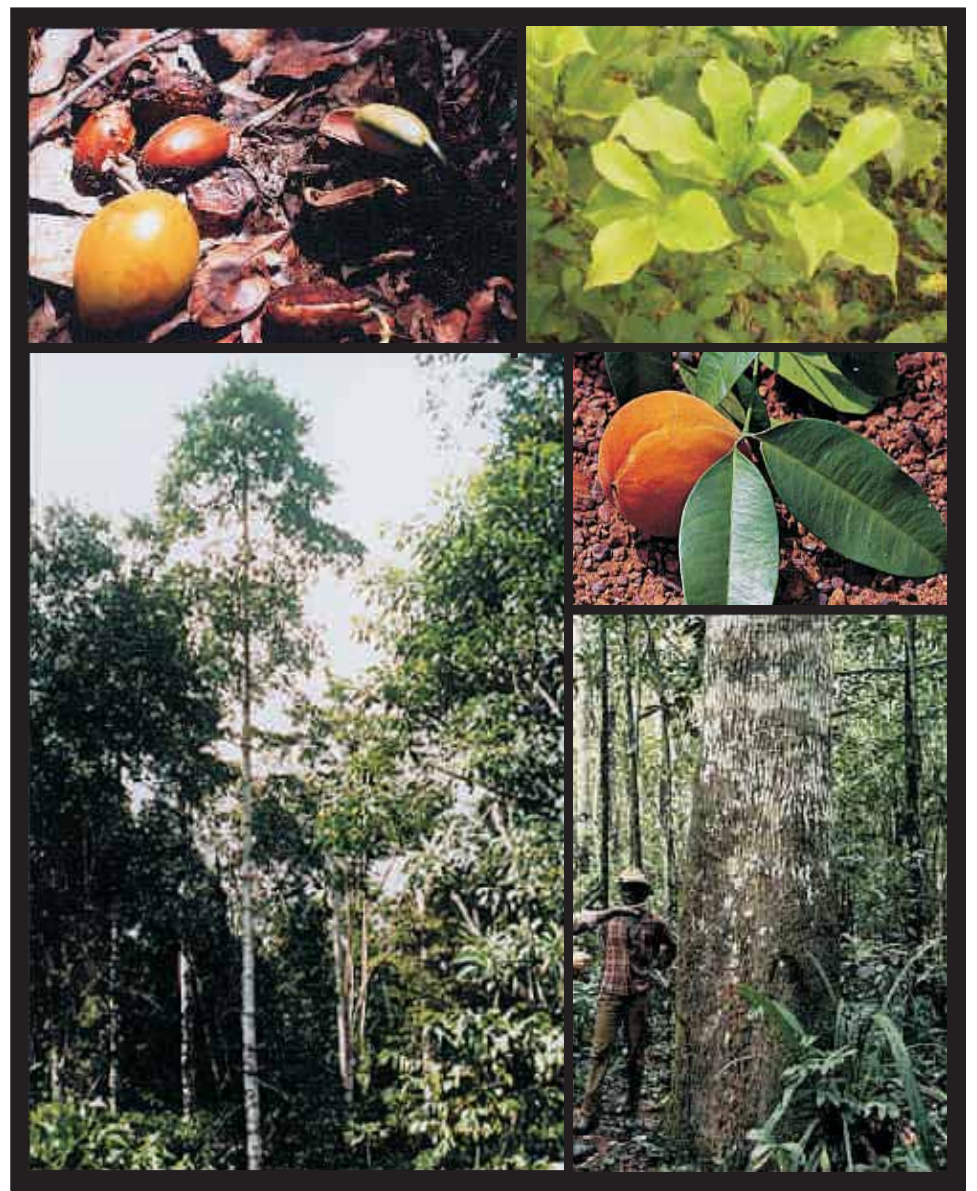
Tree branchless to	30 metres
Max diameter at breast height	100 - 300 cm
Maximum tree height	55 - 60 metres



> 30 months



Baku / Makore



✓ **Local name: Krumben / Mahogany sp.1**
Scientific name: *Khaya anthotheca*



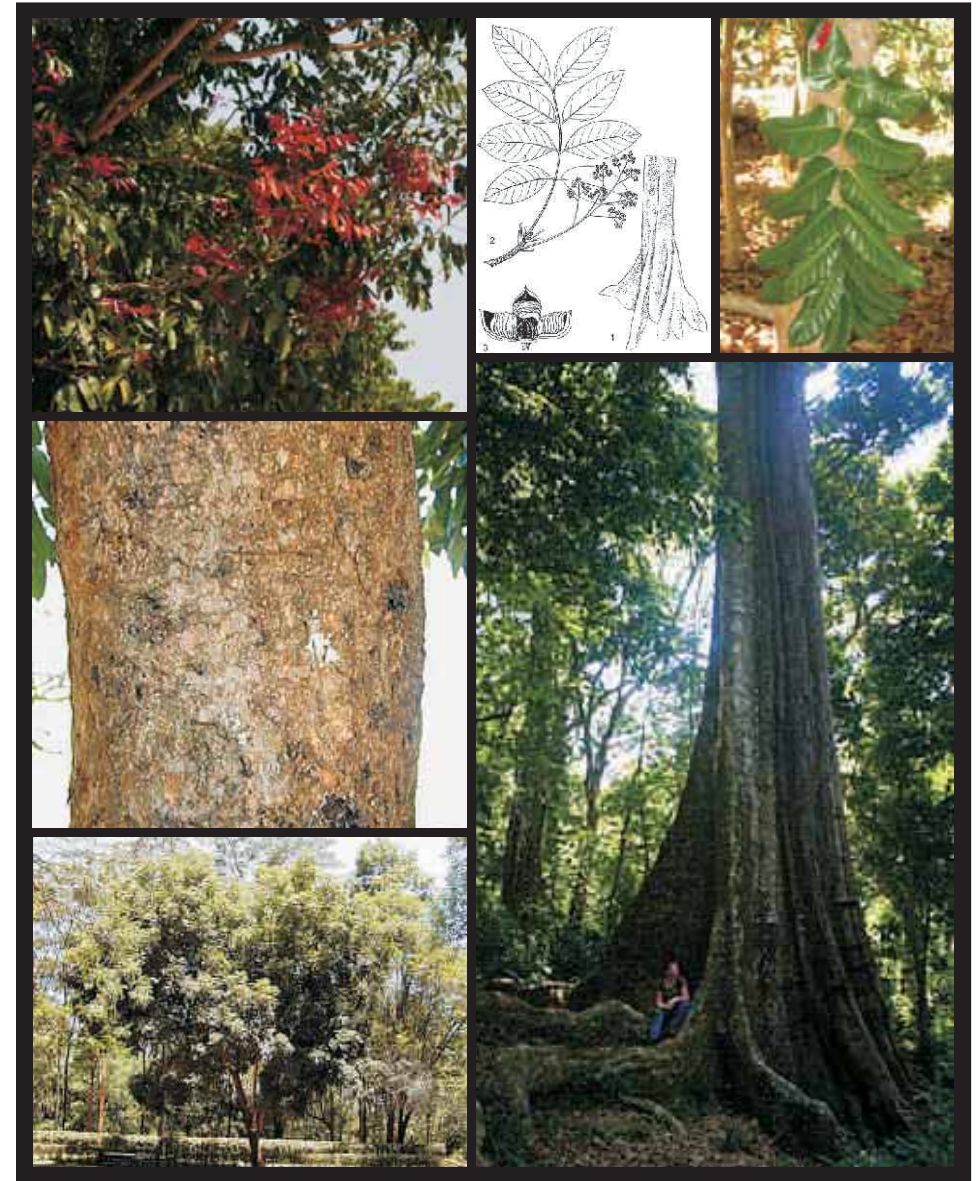
Tree branchless to	30 metres
Max diameter at breast height	120 cm
Maximum tree height	65 metres



20 - 30 cm tall



Krumben / Mahogany sp.1





Local name: Kruba / Mahogany sp.2

Scientific name: *Khaya grandifoliola*



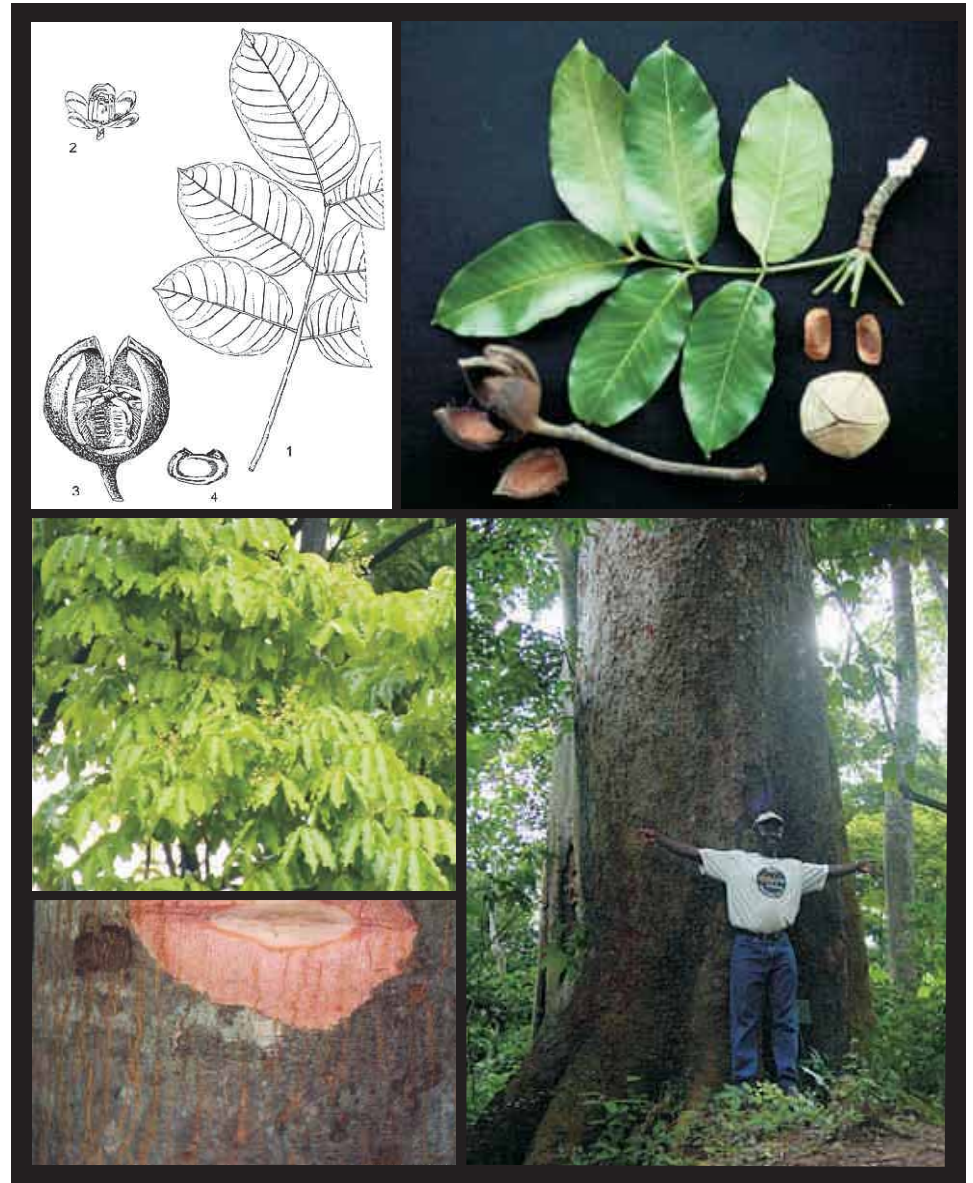
Tree branchless to	23 metres
Max diameter at breast height	120 cm
Maximum tree height	40 metres



>12 months



Kruba / Mahogany sp.2





Local name: Dubini / Mahogany sp.3

Scientific name: *Khaya ivorensis*



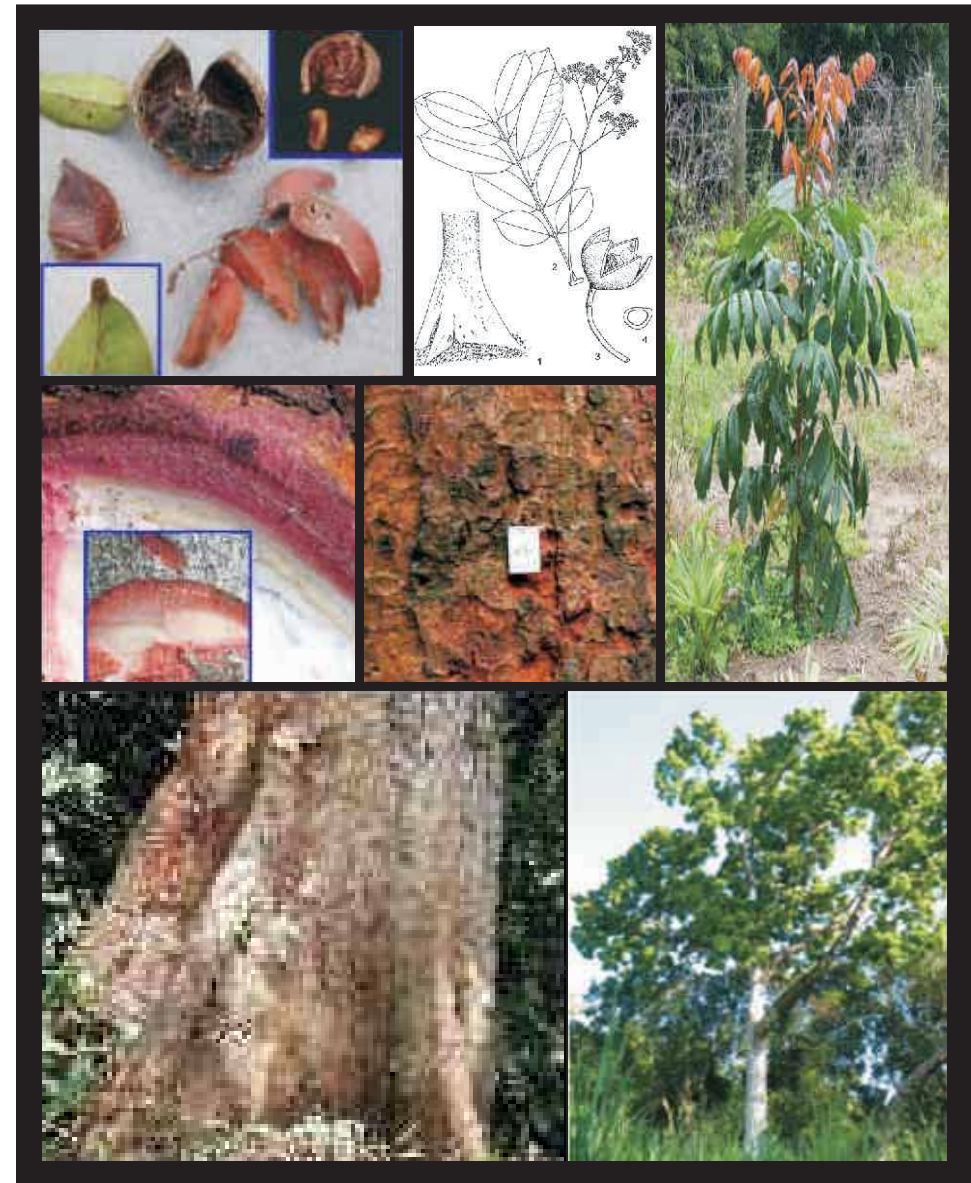
Tree branchless to	30 metres
Max diameter at breast height	120 cm
Maximum tree height	60 metres



60 - 90 cm tall



Dubini / Mahogany sp.3





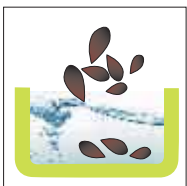
Local name: **Utile**

Scientific name: *Entandrophragma utile*



(variable Nov - Mar)

Tree branchless to	40 metres
Max diameter at breast height	200 - 300 cm
Maximum tree height	55 - 65 metres



> 6 months



Utile

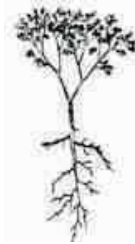




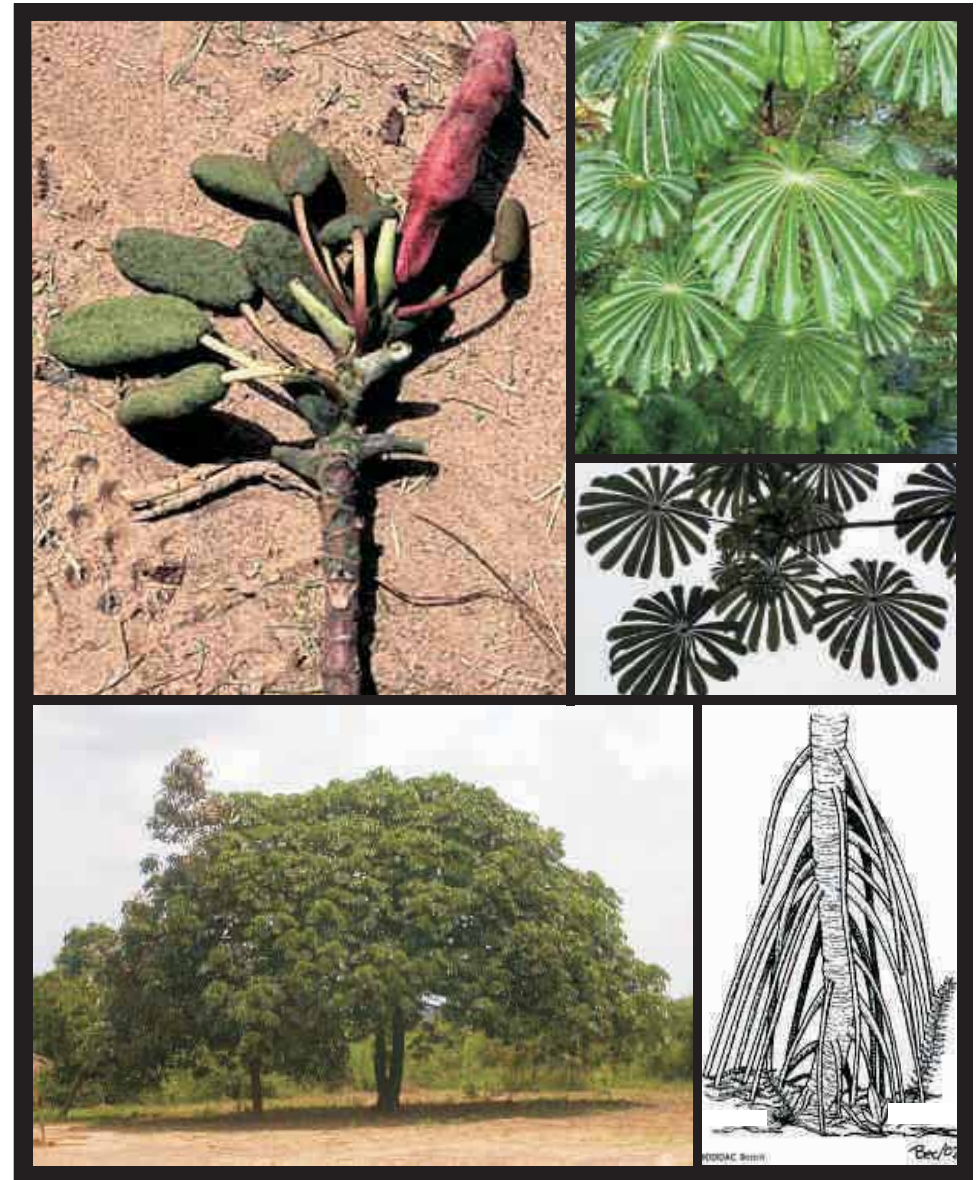
Local name: Odwuma, Umbrella tree
 Scientific name: *Musanga cecropioides*



Tree branchless to	15 metres
Max diameter at breast height	120 cm
Maximum tree height	30 metres



Odwuma

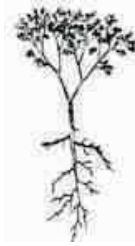




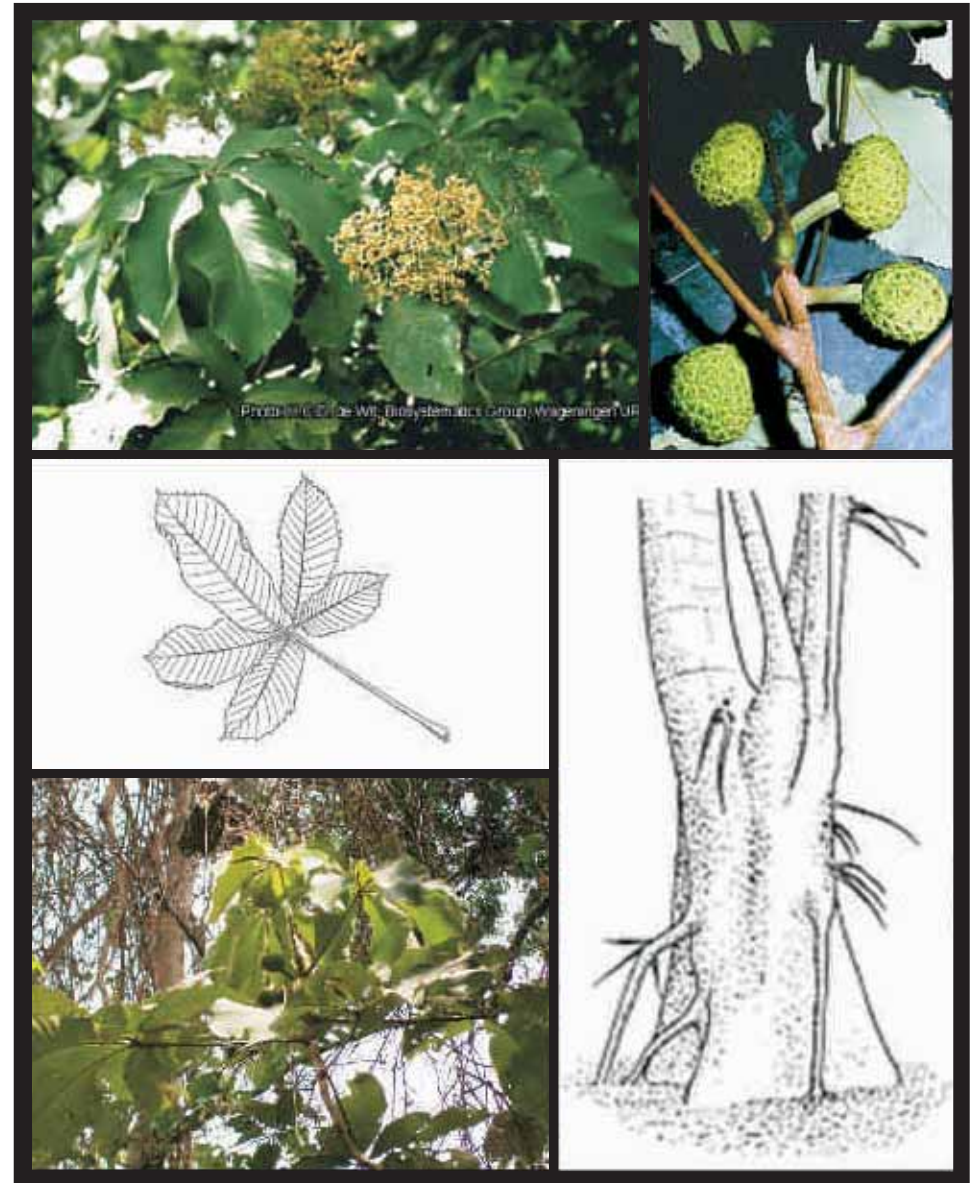
Local name: Nyankuma
Scientific name: *Myrianthus arboreus*



Tree branchless to	
Max diameter at breast height	100 cm
Maximum tree height	14 - 20 metres



Nyankuma





Local name: Osonkrobia, Penamfere, Kra-bise
 Scientific name: *Chlamydocola chlamydantha*,
Cola chlamydantha



Tree branchless to	
Max diameter at breast height	30 cm
Maximum tree height	20 metres



Osonkrobia





Local name: Sua-bese, Kwakuo-bese

Scientific name: *Carapa procera*



Tree branchless to	Base
Max diameter at breast height	80 cm
Maximum tree height	30 metres



Sua-Bese

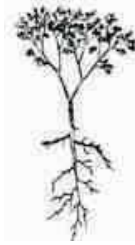


X

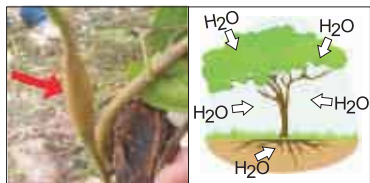
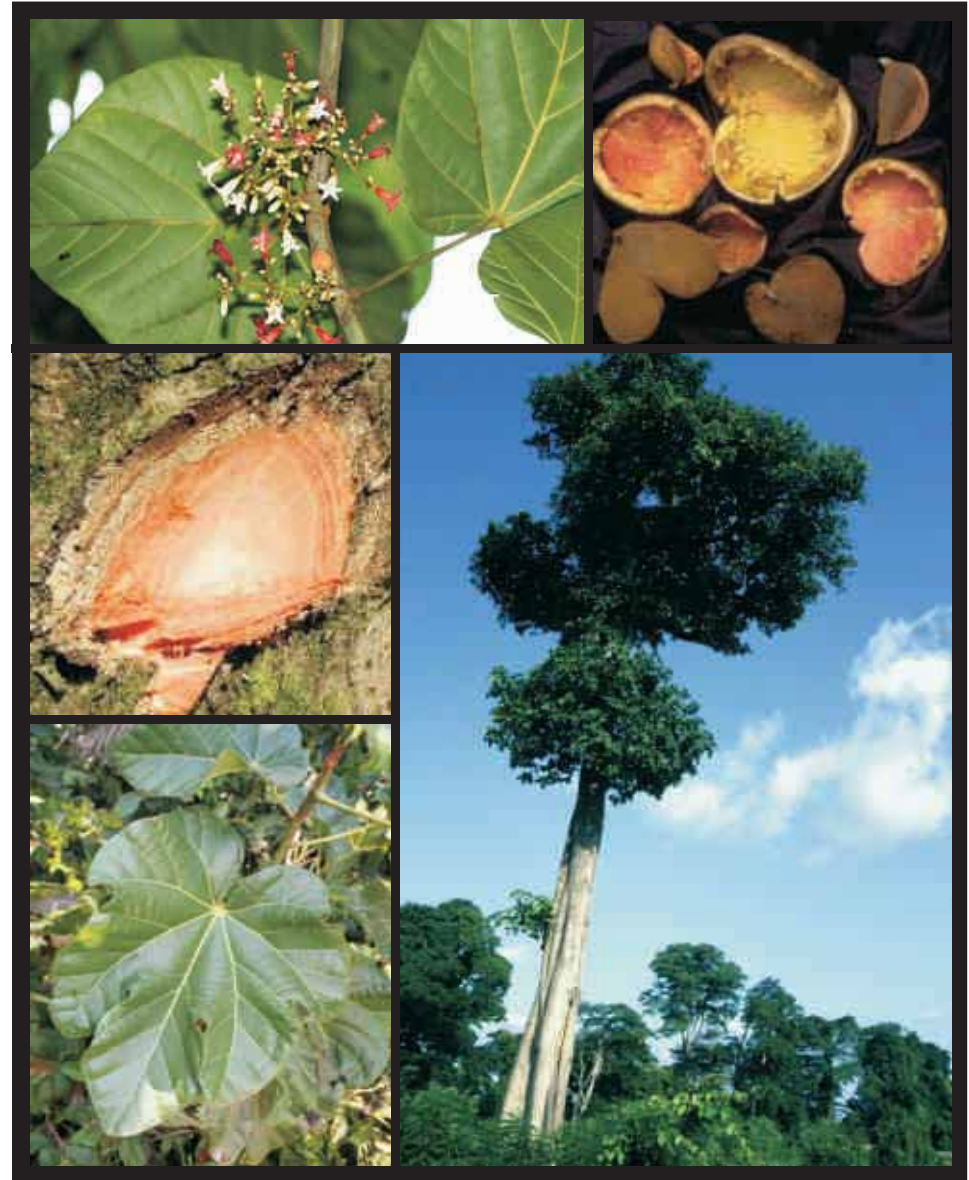
Local name: Watapuo
Scientific name: *Cola gigantean*



Tree branchless to	35 metres
Max diameter at breast height	
Maximum tree height	50 metres



Watapuo



INDEX - TREE SPECIES

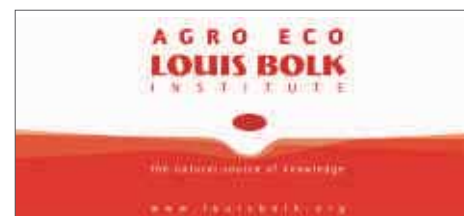
Scientific name	Local name	Page
<i>Alsonia boonei</i>	Nyamedua	16 - 17
<i>Carapa procera</i>	Sua-bese, Kwakuo-bese	40 - 41
<i>Chlamydocola chlamydantha</i>	Osonkrobia Penamfera Kra-Bise	38 - 39
<i>Cola gigantean</i>	Watapuo	42 - 43
<i>Entandrophragma angolense</i>	Edinam	20 - 21
<i>Entandrophragma cylindricum</i>	Sapele	22 - 23
<i>Entandrophragma utile</i>	Utile	32 - 33
<i>Khaya anthotheca sp.1</i>	Krumben / Mahogany	26 - 27
<i>Khaya grandifoliola sp.2</i>	Kruba / Mahogany	28 - 29
<i>Khaya ivorensis sp.3</i>	Dubini / Mahogany	30 - 31
<i>Milicia exelsa</i>	Odum	12 - 13
<i>Musanga cecropioides</i>	Odwuma	34 - 35
<i>Myrianthus arboreus</i>	Nyankuma	36 - 37
<i>Pycanthus angolensis</i>	Otie	18 - 19
<i>Terminalia ivoriensis</i>	Emire	10 - 11
<i>Terminalia superba</i>	Ofram / Framo	14 - 15
<i>Tieghemella heckelli</i>	Baku / Makore	24 - 25

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More information on the tree species could be found in the online PROTA (Plant Resources Of Tropical Africa) database, <http://database.prota.org/search.htm>



Agro Eco-Louis Bolk Institute is an advisory organisation based in the Netherlands but with branch offices in various African countries, including Accra, Ghana, which serves the West African region.

Agro Eco-LBI advises the private sector, NGOs, governments and international organisations in the development of niche markets for quality products, notably certified organic, Rainforest Alliance and Fairtrade products. It has been active in Africa since 1990 and tens of exporters and ten-thousands of smallholder farmers are profiting from the access achieved to higher paying markets that however set high quality standards. We provide farmer supplier group organisation, conversion planning, technical assistance, research, preparation of grower group certification, quality programmes, market studies and linkages between exporters and importers.

Some of our current running projects are the Nyinahini Sustainable Cocoa Project (organic-RA), Aponoapono Biakoye Organic Cocoa Farmers Association (ABOCFA) project (organic-FT), Mars Partnership for African Cocoa-Communities of Tomorrow (iMPACT), Bia biodiversity project (RA) and the Fine Flavor Cocoa Project in Offinso.