

# **Parts of a rattan**

**The stem**

**The leaf sheath**

**The leaf**

**The climbing organ**

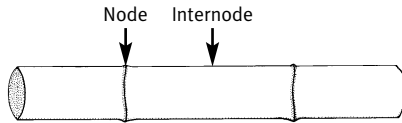
**The inflorescence**

**The fruit**

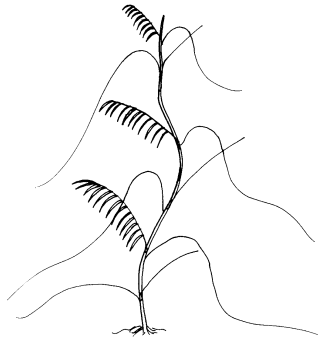
# Parts of a rattan

## The stem

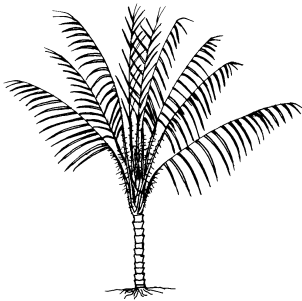
Raised rings divide the stem into segments (**internodes**) like a bamboo stem but it is woody and solid. One leaf sheath (see next section) is attached at each ring.



Most species have **climbing** stems so their internodes are long and flexible. A few species (e.g. *Calamus harmandii*) have short stiff internodes and an **erect** stem like a small tree. One species (*Calamus acanthophyllus*) has internodes so short that it appears **stemless**.



climbing stem



erect stem

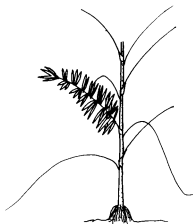


stemless

Most rattan species can produce new stems from the rootstock. This is called the **clustering** habit. Some species cannot do this so an individual only ever has one stem. This is the **solitary** habit. The Lao species of *Korthalsia* can produce **branches** anywhere along the stem and other species can produce a branch occasionally if the shoot is damaged.



clustering habit



solitary habit



branching habit

The **stem length** is best measured from the ground to the base of the last fully unfurled leaf. In many climbing species this length can exceed 30 m and a few have been recorded over 100 m long. The exact length is not very helpful for identification because it often depends more on the age of the

stem rather than its species. However, it seems that some species only ever produce quite short stems (e.g. *Calamus henryanus* and *Calamus hypoleucus*) which can be a clue for identification.

The new leaves and new stem segments are produced only at the tip of the stem, which is soft and fleshy. This part is often called the **shoot**. The shoots of many species are considered delicious vegetables by Lao people. Overlapping leaf sheaths conceal the shoot and upper part of the stem. Eventually the older leaves die, fall off and are not replaced, leaving the lower, woody part of the stem bare.

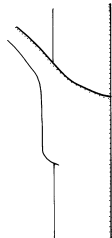
Once it has become woody the **diameter** of the stem is fixed and, unlike a tree, it cannot get thicker as the plant gets older. The diameter can vary greatly between individuals or between the base and tip of a stem, but it can provide some clues for identification.

## The leaf sheath

The lowest part of the leaf usually forms a tough tube, the **leaf sheath**, embracing the stem. In some species (most *Calamus* and *Daemonorops* species) there is a strong fold just below where the rachis begins. This looks like a big nose and is called the **knee**. It may be very clear or quite indistinct.



clear knee

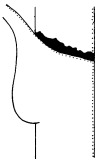


indistinct knee

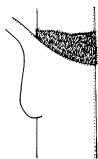


no knee

At the mouth of the sheath there is often a weak, non-woody outgrowth called an **ocrea**. In Lao species this usually takes one of the following forms:



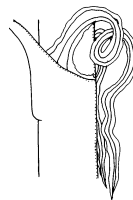
**Ocrea** tiny, dry, unarmed



short bristly collar



bristly ears



long, papery



long, net-like

**TAKE CARE! The ocrea breaks off easily.**

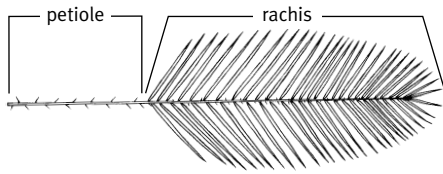
If you don't see an ocrea on one sheath don't assume there is never one!

**Sheath spines** are extremely variable. Try to look at their colour, abundance, maximum length, position, the presence of very short spines, the way they grow (singly or joined in rows) and their shape (thick, flat or needle-like). Spines on newly emerged sheaths may be bright red or yellow but on older sheaths they often become dull green. Rather than use technical words we rely mainly on pictures to show the character of the spines in each species. Note that the presence or absence of spines on the knee can vary between adjacent sheaths on a single stem in several species and is useless for identification in Indochina.

Newly emerged sheaths often have a lot of **indumentum**. This is the dusty, fluffy or waxy coating on the surface of a rattan. It is easily rubbed off with your fingers and in nature tends to be worn away as the surface gets older. On sheaths it may be white, red, brown or black and occur in patches, in neat stripes or all over. It wears off quickly except where it is protected by spines.

## The leaf

The leaf is made up of a long main axis, the **rachis**, which has many **leaflets** along it. The lowest part has no leaflets and is called the **petiole**. The length of the petiole is useful for identification.

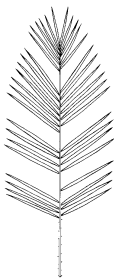


**TAKE CARE!** Leaves near the ground have long petioles in almost every species. **Measure the petiole on the uppermost leaves**, i.e. At least 2-3 m from the ground in slender species and more for larger ones.

The **leaflet arrangement** is a useful identification feature, although in some species more than one arrangement may be seen. Again, try to look at the upper leaves rather than those at the base of the stem. Here are some of the main types:



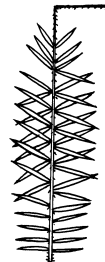
regular



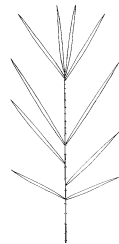
interrupted pinnate



strongly grouped



some grouped, some regular



irregular

Most species have the leaflets in two neat rows so they lie **all in one plane** and the leaf looks flat overall, like a coconut leaf. A few have the leaflets pointing in all different directions (up, sideways, even down) so that they lie **in many different planes**.

The **leaflet shape** can also be distinctive, although this is even more variable. Shape is difficult to describe in words so we concentrate on using pictures in this book. One phrase we do use is **boat-shaped**. This means the surface of the leaf is very strongly curved like the hull of a boat. It is typical of *Calamus acanthospathus* and *Calamus palustris* amongst others. Most species have much flatter leaves, although all have the base strongly creased to form a roof-shape where they join the rachis.

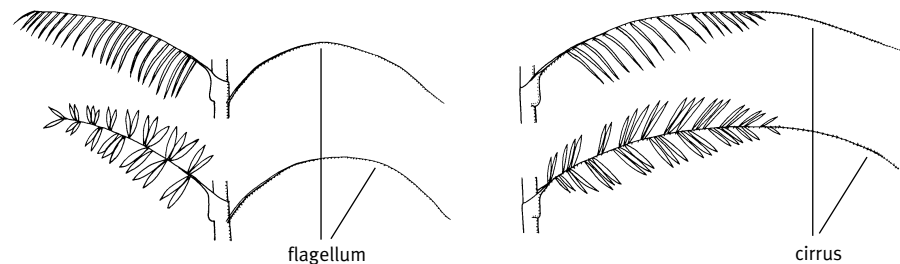
The **leaflet size** varies greatly so to compare with the sizes in this book measure the largest leaflets you can find. When looking at the size range we give for a species remember that especially small leaves are much more likely to be found than especially large ones.

The **leaflet surface** and **leaflet margins** are often **bristly**. Look closely at where the bristles occur. The surface bristles are usually growing from the main veins – the number of main veins and the number which have bristles are worth noting for both upper and under surfaces. Most are short, black and pressed flat – take special note if they are long ( $\geq 5$  mm), pale coloured or stand up.

Some species have **whitish indumentum** on the underside of the leaflets. This is a very good clue for identification.

## The climbing organ

On some species the **climbing organ** grows from the tip of the leaf and is then called a **cirrus**. On other species it grows from the leaf sheath and is then called a **flagellum**. The flagellum is a modified flower head. *Calamus bimaniferus* is unique in Indochina because it has a short flagellum *and* a short cirrus.



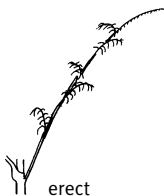
**TAKE CARE!** Seedlings and the lowest part of a stem do not usually have climbing organs. **Look at the highest leaves** – for bigger species that means at least 3 m off the ground.

## The inflorescence

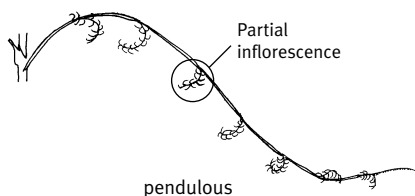
The rattan flower head or **inflorescence** is long, tough and branched. The flowers fall off quite quickly but luckily they are not required to identify the Indochinese species. The rest of the inflorescence may remain on the plant for one or two years.

Some inflorescences are quite short and **erect** with **no climbing organ**. Others are long and drooping with **pendulous branches** and a long **flagellum** reaching out beyond the flowering branches. These latter species usually also have a flagellum on non-flowering leaf sheaths.

## inflorescence habits



erect



pendulous

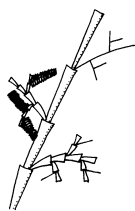
The branching pattern is quite difficult to describe. The main **axis** arises from the leaf sheath. It usually has 2-10 main side-branches. These branches may or may not branch again, and their branches may in turn branch. A few species have very simple **1-branched** inflorescences where the axis branches but these branches do not branch again (e.g. *Calamus harmandii*, female *Calamus oligostachys*). In many *Calamus* species the females are **2-branched** (meaning the axis has branches and those branches have branches) whilst the males are **3-branched** (as females, but the branches of the branches branch again). Confusingly, many species are branched more times in the part of the inflorescence near the stem than at the tip. Thus many species accounts say e.g. 1-2 or 2-3 branched, showing the range which can be found. A level-1 branch plus all its side branches is called a **partial inflorescence**.



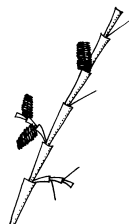
1-branched



2-branched



3-branched



1-2 branched

The inflorescence branches are entirely wrapped in tough tubular sheaths called **bracts**. These are often covered with spines and claws. Non-climbing species have no claws on the bracts, although some have straight spines. Some species have very **tightly sheathing bracts**, others have them quite loosely fitting or **inflated**.

## Types of inflorescence bract



tight



inflated  
+ entire



slightly  
tattered



lacerate



flat limb



cover the whole  
inflorescence

The mouth of the bract stays neatly tubular (**entire**) in most species, becoming **slightly tattered** as the inflorescence dries and ages. However, in some species the mouth breaks up into long strips and fibres (**lacerate**) and in two species (*Calamus guruba* and *Calamus hypoleucus*) the mouth opens out to form a neat, nearly **flat limb** or sheet. This can be compared with *Daemonorops* sp A and sp B where the bracts also open out but it is the **whole bract** (split right to the base) which does this, not just the mouth. In *Daemonorops jenkinsiana* the bracts cover the whole inflorescence until flowering is over, then they split right to the base.

The axis and intermediate branches do not bear flowers – only those at the last level of branching do. A branch bearing flowers is called a **rachilla** (plural **rachillae**). The length, shape and arrangement of the rachilla are important for identification.



Rachillae (all life size)

*Calamus guruba* ♂

*Calamus rhabdocladus* ♂

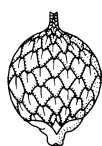
*Calamus palustris* ♀

*Calamus flagellum* ♀

In most of the genera in this book there are separate male and female plants, but in *Korthalsia* each individual flower has male and female parts (they are hermaphrodite). In *Calamus* and *Daemonorops* the male flowers are solitary in their rows but each female flower is closely paired with an infertile male flower. Nobody knows why. This makes it easy to tell the sex of a *Calamus* or *Daemonorops* inflorescence. *C. viminalis* and *C. siamensis* often have two female flowers and one infertile male flower clustered together at each flowering site – this gives the rachilla a distinctive crowded appearance and means the fruits are often crowded in four rows instead of two.

## The fruit

Ripe rattan fruits can be hard to find because they occur seasonally. However, if you do find them they are very useful for identification. The **shape** is often nearly spherical (globose) but some species are egg-shaped, top-shaped, cylindrical or ellipsoid. Most species have a short, very abrupt **beak** but in a few this is long and tapered.



Fruit shapes

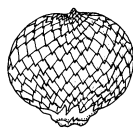
globose, short beak



ovoid, long beak



ellipsoid



top-shaped

The **size** in this book is measured as **length** (from the bottom of the fruit to the tip of the beak) and **width** at the widest point. The range given covers ripe and nearly-ripe fruit, but of course they begin life much smaller.

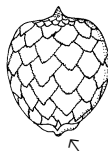
The **colour and pattern** of the fresh ripe fruit is important but it changes in herbarium specimens so it is poorly known for many species. The scales often have dark or pale margins which may be broad or narrow. The scales are often smooth but in several species they are **channelled** down the centre of each scale, the channels lining up to give the fruit a conspicuous ribbed appearance.



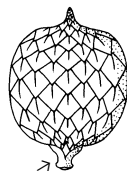
scales channelled



scales not channelled



perianth fully open



perianth partly tubular

The leathery outer layer of the flower (the calyx) remains after pollination and forms a star-shaped cup supporting the fruit. This is the **fruiting perianth**. In some species the arms of the star only run part way to the base and the base remains **partly tubular**, lifting the fruit away from the rachilla. The perianth is not included in the length of the fruit.

Inside the seed may be plain whitish (**not ruminant**) or decorated with lots of radiating dark lines (**ruminant**).

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