



Identification of hardy bamboos

In the UK there are presently about 50 species of hardy bamboo under cultivation, representing about 15 out of the 20 or so hardy genera presently recognised. The naming of these bamboos has been the cause of much disagreement in the past, but the list of recognised genera is now, touch wood, considerably more stable. However, the boundaries between species are still not well known, and it is quite likely that the species names given to some bamboos will change.

The two main causes of the confusion over bamboo names are the tendency for hardy bamboos to come from remote and often inaccessible regions of the world, and their infrequent flowering. Bamboos still require much basic investigative work in their natural habitats to complete our knowledge of species, and several generations of taxonomists will probably have to work on this problem as they take so long to flower.

Nevertheless bamboos are not really as difficult to identify as some might think. For a long time it was considered impossible to identify a bamboo without its flowers. We now know much more about vegetative structures such as rhizomes and branches and we can use this knowledge to distinguish all the commoner bamboos without their flowers, although some distinctions require considerable technical knowledge.

The biggest problem facing most people who want to identify bamboos is recognising the different genera. This is well worth pursuing however, as once it has been achieved it is much easier to find the right species. A basic key is given below, allowing most bamboos to be placed in the correct genus with the minimum of technical knowledge. It is possible to recognize many genera quite easily from a quick inspection of the culms and leaves, but others require a more thorough investigation, and a few will probably require excavation of a section of rhizome. Oddities and exceptions do occur, however, and a simple key will always have its limitations, especially as new bamboos are brought into cultivation.

Bamboos are in the grass family and the stems of all grasses are called culms. They are generally circular and hollow in cross-section in bamboos, but they may be solid and there may be a degree of flattening on one or on all four sides.

These are important characteristics, quickly identifying a few genera of bamboos. The possession of thorns at the nodes of the culm is very rare and quickly separates out a small number of bamboos. The colour of culms is of great importance in horticulture, and many striking cultivars with distinctive culms are in cultivation. It should be remembered that similar colour variations can occur in different species, but the more distinctive culm colour patterns can sometimes be used for positive identification of the species concerned. However, the actual species to which unusual cultivars of bamboos belong is occasionally not known. Flowering can be very important in such cases, as the seedlings usually revert to the typical characteristics for the species.

The surface of the culm is also important. Young culms have a coating of wax, which can be either thick and furry, or thin, and either light or dark in colour, and it may rub off quickly to leave the culms shiny, or it may persist so that the culms stay matt and dull or turn black as the wax becomes dirty. The joints of the culm (nodes) may be level, or raised to varying degrees. *Chimonobambusa* is characterised by its swollen nodes, and includes the rare walking stick bamboo *C. tumidissinoda*, with the most swollen nodes of any bamboo. The nodes may be marked with rings of different colours, and they may bear small aerial roots or thorns. The surface of the culm may be rough with tiny sharp points, or smooth, or it may be covered in small vertical ridges. The internodes of many species have a tendency to swell out in cultivars of several, mostly tender, species. These 'Buddha's belly' bamboos require deliberate and often harsh cultivation techniques to maintain the desired appearance, and they quickly revert to the standard form if given more considerate treatment.

Branching is particularly important in the bamboos, and there are very few other grasses that develop complex branch systems. It is especially important for the separation of genera. The number of branches in the first year of growth should be noted, as well as the eventual number of branches that older culms develop. Nodes higher up the culm have more branches than those lower down. Therefore, to standardize, branches from about 2/3 of the way up the culm should be investigated. Whether these branches are all the same size is important, or whether one branch is larger than the others.

Unfortunately, one of the most fundamental considerations in modern bamboo taxonomy is the nature of the rhizome and how the culms arise from it. The type of rhizome will probably determine whether the bamboo grows in a clump (clump-forming), or spreads widely (running), and so is important for both identification and siting of a bamboo. Rampant bamboo species with widely spreading rhizomes can become a nuisance, especially in hotter areas. Clump-forming bamboos usually have rhizomes that are thicker than the culm at some point (pachymorph) and the necks of the rhizomes are short (short-necked pachymorph). Running bamboos may have uniformly thin rhizomes, always narrower than the culm (leptomorph), or they may have rhizomes that are fatter than the culms where they bear roots, with long thin usually rootless necks up to 2m in length (long-necked pachymorph). Leptomorph rhizomes are hollow and develop roots at all nodes as long as they are under the ground. The necks of pachymorph rhizomes may be either solid or hollow, and they never bear roots in presently cultivated bamboos.

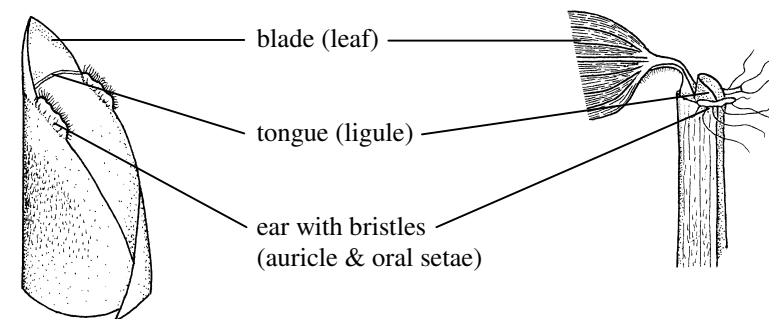
Rhizomes are obviously difficult to examine as they usually remain under the ground. Fortunately it is nearly always possible to identify bamboos without looking at the rhizomes. Strangely enough one of the best above-ground clues to rhizome form is the growth of leaves. Those bamboos with leptomorph rhizomes that can continue growth underground indefinitely do not produce leaves indefinitely on the same branchlet, instead producing new leaves on new branchlets each year. Those bamboos with pachymorph rhizomes, which must turn up at the end to become a culm, often produce a long series of leaves almost indefinitely, season after season, on the same branchlet, leaving a series of bare nodes and dead leaf sheaths on the older branchlets. This makes the branches heavier, so that the culms are more pendulous than those of bamboos with leptomorph rhizomes, which tend to be more upright. The exception to this rule is *Chusquea*, which often has leptomorph rhizomes but produces long sprays of branchlets on pendulous culms, and consequently has a disorganized, straggly appearance.

Once the genus of a bamboo has been determined, to identify it to a particular species the most important part of the plant is usually the culm sheath. This is the protective sheath which encloses each internode of the soft young culms as they grow, and falls off later when the culms have hardened, see fig. 1. The culm sheaths are specialised leaf sheaths and they have the same components, see fig. 2, except that the leaf is reduced to a short, hard blade that does not

photosynthesize. At the top of these sheaths there is a projecting tongue in the centre called the ligule, and ears on each side called auricles. The shape and size of the auricles, and whether there are stiff bristles on their edges are all important. The shape, length and the type of edge on the ligule should also be noted. The blade of the culm sheath is also useful. Its shape, whether it has hairs on the back or around the base, whether it is erect or bent backwards (reflexed), and whether it falls off early (deciduous), or will remain attached (persistent), are also all important characteristics. It should be noted that culm sheaths at the culm base are different from those higher up. They are broader and have shorter blades. To standardize descriptions, culm sheaths from approximately $\frac{1}{4}$ of the way up the culm from the base are normally used.

Fig. 1 Culm sheath

Fig. 2 Leaf sheath



New culm sheaths show the features of the species best. Older sheaths often have lost important parts, and for this reason bamboos are easiest to identify in the late summer and autumn. In winter and spring care must be taken to find undamaged sheaths. In the same way, leaf sheaths are damaged by strong wind and rain so that auricles, bristles, and hairs may have disappeared after a few months.

Leaves are often variegated in horticulturally important bamboos. Forms with yellow or white stripes or patches on the leaves are common, especially in Japanese bamboos that have been selected and cultivated over a very long period of time.

Flowers of bamboos are occasionally found. Although it was once thought that the identification of a bamboo can never be totally confirmed without its flowers,

the opposite is sometimes true, and the hardest collections of bamboos to identify are often those with only flowers and no vegetative parts. There are two main kinds of bamboo inflorescence, those with many leafy sheaths among the spikelets, (*Phyllostachys*, *Chimonobambusa*, *Shibataea*, *Hibanobambusa*), and those without leafy sheaths, having either a more open form of inflorescence closer to that of a normal grass (*Yushania*, *Arundinaria*, *Pleioblastus*, *Sasa*, *Pseudosasa*), or a denser form (*Thamnocalamus*, *Fargesia*, *Borinda*, *Himalayacalamus*). Bamboos also vary in the number of stamens within each floret. Nearly all hardy bamboos have 3 stamens, only those of *Sasa* and *Sasaella* having 6 stamens.

Basic key to genera

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| 1. Culms solid | <i>Chusquea</i> |
| 1a. Culms hollow. | |
| 2. Nodes substantially raised | <i>Chimonobambusa</i> |
| 2a. Nodes slightly raised or not raised at all. | |
| 3. Culms always flattened all along one side of branch-bearing internodes. | |
| 4. Branches usually 2, sometimes 3 | <i>Phyllostachys</i> |
| 4a. Branches 1-many | |
| 5. Branches arise at the same level | <i>Shibataea</i> |
| 5a. Branches arise at different levels | <i>Hibanobambusa</i> |
| 3a. Culms completely rounded or flattened on one side for part of internode above branches. | |
| 6. Branches always solitary. | |
| 7. Leaves very large relative to culm height | <i>Sasa</i> & <i>Indocalamus</i> |
| 7a. Leaves normal size | <i>Pseudosasa</i> & <i>Sasaella</i> |
| 6a. Branches 1–many. | |

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| 8. Leaves with no visible cross-veins | <i>Himalayacalamus</i> |
| 8a. Leaves with visible cross-veins (tessellate). | |
| 9. Rhizomes leptomorph | <i>Arundinaria</i> & <i>Pleioblastus</i> |
| 9a. Rhizomes pachymorph. | |
| 10. Branches usually 3–7 | <i>Thamnocalamus</i> |
| 10a. Branches usually 5–15. | |
| 11. Rhizomes eventually up to 30cm long | <i>Fargesia</i> & <i>Borinda</i> |
| 11a. Rhizomes eventually up to 2m long | <i>Yushania</i> |

Further reading

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