POTENTIAL NATURAL VEGETATION FOR SOUTH-WESTERN AND CENTRAL KENYA

A tool for the selection of indigenous tree species

Guidelines for identifying indigenous tree species

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Purpose of these guidelines

This is a short document that shows how to select tree species that are expected to be ecologically suitable for a particular vegetation type. These vegetation types occur within an area in central and south-western Kenya that we mapped, although the distribution of some vegetation types expands the borders of the vegetation map that is included on this CD-ROM. This document also shows how to select a subset of suitable species on the basis of products or services ('tree uses') that you want to obtain from the trees.

Step 1

Determine the potential natural vegetation types (hereinafter 'vegetation types') of the areas that you are interested in. Guidelines for identifying vegetation types from the electronic versions of the map of central and south-western Kenya are provided in accompanying guidelines (**GuideMapSheets.pdf**, available from the **MapSheets** folder on the CD-ROM).

These vegetation types should be any of the 17 vegetation types listed in Table 1. Indigenous tree species are only listed for 12 of these vegetation types. The vegetation types for which species are available are indicated in the second column of table 1 ('Yes').

Table 1 Potential natural vegetation types

Potential natural vegetation type	Species?
Alpine	No
Mountain scrubland and moorland	No
Bamboo woodland and thicket	Yes
Moist montane forest	Yes
Dry montane forest	Yes
Moist intermediate forest	Yes
Dry intermediate forest	Yes
Upland *Acacia* woodland, savanna and bushland	Yes
Broad-leaved savanna-evergreen bushland mixtures	No
Lowland *Acacia-Commiphora* woodland, bushland and thicket	Yes
Moist *Combretum-Terminalia* savanna	Yes
Dry *Combretum* savanna	Yes
Evergreen and semi-evergreen bushland	Yes
Semi-evergreen thicket	Yes
Papyrus and swamp	No
Open grassland areas on clay plains	No
Acacia and allied vegetation on soils with impeded drainage	Yes

Step 2

If some of the vegetation types of the area that you are interested in have species lists (see above and especially table 1), then determine the uses of the indigenous tree species that you are interested in. These uses should be any of the uses listed in table 2.

Table 2 Documented uses

Main category	Uses
Wood	Firewood
	Charcoal
	Timber, furniture, construction
	Poles, posts
	Flooring
	Veneer, plywood
	Boat building
	Beehives
	Tools, tool handles, shafts
	Carvings, utensils, walking stick, bow, arrow
	Farm implements
Food	Edible fruit, nuts, seed
	Vegetable, edible leaves, edible roots
	Seasoning, flavouring
	Drink, Soap
	Edible oil, gum, inner bark
	Jam, Syrup
	Medicine
Fodder	Fodder
	Bee forage
Environmental	Shade
	Ornamental, avenue tree
	Mulch
	Nitrogen fixation
	Soil conservation, soil improvement
	River bank, sand stabilization
	Windbreak
Other	Fibre, weaving, rope
	Thatch, roofing, mats, baskets
	Resin, gum, glue, latex
	Tannin, dye
	Live fence, dead fence
	Ceremonial
	Toothbrushes
	Boundary marking
	Veterinary medicine
	Toxin, insecticide, repellent
	Cosmetic, soap, perfume, oil
	Brooms

Step 3

We crosstabulated suitable tree species for each vegetation type with potential uses of these species (those uses that were listed in table 2). The information on the crosstabulation of species with uses is available in two different formats: PDF (as a table) and MS Excel (as a spreadsheet).

The PDF tables were prepared for each vegetation type with documented tree species. These tables are available from the **Species/VegetationLists/PDF** folder on the CD-ROM. The advantage of the PDF format is that the tables can be read and printed via the freely available Adobe Reader.

The **SpeciesSelector.xls** spreadsheet is available from the **Species** folder on the CD-ROM. This spreadsheet was prepared in MS Excel. In case that you do not have MS Excel, then you could install the freely available OpenOffice (URL http://www.openoffice.org). The advantage of the Excel spreadsheet is that it allows for interactive selection of subsets of suitable tree species on the basis of the different uses that are required from these species. The Excel spreadsheet also has links to fact sheets for particular tree species (see step 5). ***Check in the appendix for some further guidelines on using the interactive selection ('AutoFilter') methods provided in the spreadsheet.***

Step 4

What is important to know is that we did not always have the same confidence about the ecological suitability of a particular tree species within a particular vegetation type. We summarized our confidence in ecological suitability of a tree species by providing a rank for each documented species for each vegetation type. This means that we are more confident about a species with rank 1 than a species with rank 2, that we are more confident of a species with rank 2 than a species with rank 3 and so on. It is therefore important to check for the rank order of the species that you selected. These rank order are also provided in the tables and spreadsheets discussed in step 3.

Step 5

Once you have selected a subset of tree species (as shown in steps 3 and 4), you can read some additional information on these species from fact sheets that provide information that is specific for particular indigenous tree species. These fact sheets are available in PDF format and were obtained from different sources (see below). Consult these fact sheets to check whether the selected species will suite your purposes and revise the selected subset of species if necessary.

Information for 122 species was obtained from the Agroforestree Database. These documents can be found in the **Species/AgroForesTree** folder on the CD-ROM.

Information for 207 species was obtained from a book on Useful Trees and Shrubs for Kenya. These documents can be found in the **Species/UsefulTrees** folder on the CD-ROM. Note that for some species, information is provided in the *Remarks* section of a fact sheet devoted to another species.

Information for 21 species was obtained from the Seed Leaflets series published by the Danish Centre for Forest and Landscape (**Species/SeedLeaflets** folder on the CDROM). These two-page information sheets focus more on seed information.

A separate document **SpeciesFactSheets.pdf** shows for which species and from which information sources fact sheets are available. This document also shows differences in species names used in different sources. The spreadsheet (step 3 and as shown in the appendix) provides direct links to fact sheets for specific species.

Please cite these references when you publish information from any of these sources:

> Maundu P and Tengnas B. 2005. **Useful Trees and Shrubs for Kenya**. Nairobi: World Agroforestry Centre. 484 pp.
>
> Simons AJ, Salim AS, Orwa C, Munjuga M and Mutua A. 2005. **AgroForesTree Database: a Tree Species Reference and Selection Guide.** Version 3.0 CD-ROM. ICRAF: World Agroforestry Centre.
>
> The *Seed Leaflets* have a specific citation for each species as this series was originally published in separate leaflets.

Step 6

Try to verify the species that you selected with other sources of information, including asking some local experts (such as foresters or ecologists, but also experienced farmers).

Step 7

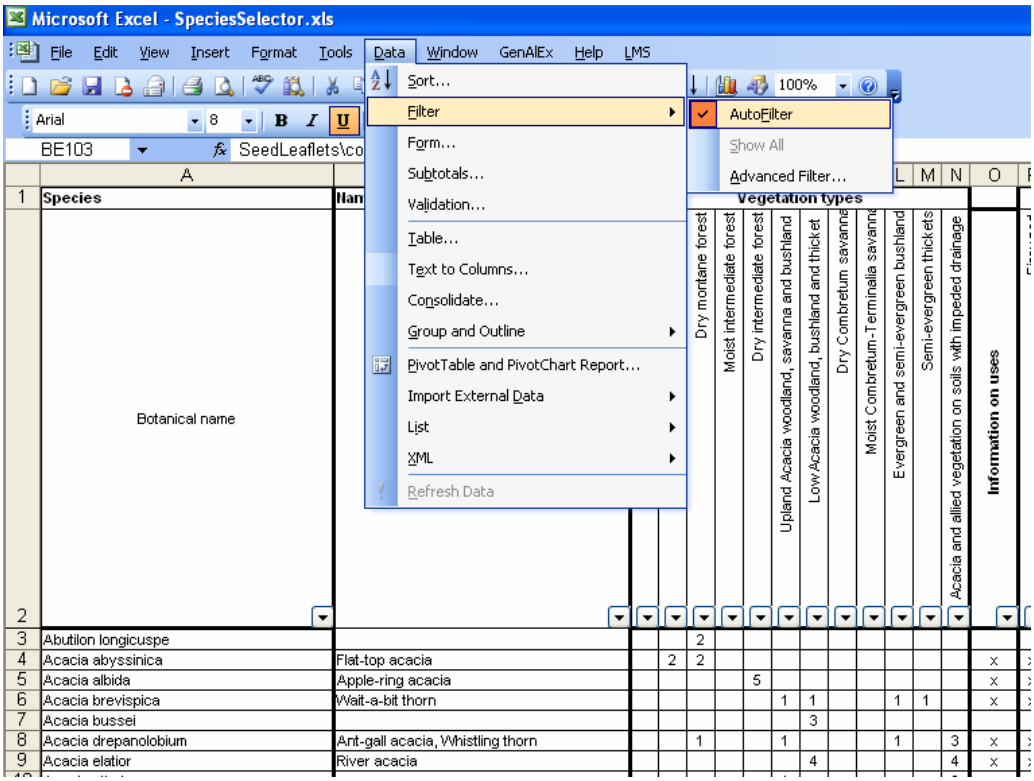
Familiarize yourself with the methods that were used to compile species lists for vegetation types. The methodology is explained in the documentation (**VegMapSummary.pdf** and **Vegetation II DE7.pdf**, both available from the **Documentation** folder on the CD-ROM). Pay particular attention to some remarks on potential limitations of the approach.

Appendix: Example of using the interactive selection features of the spreadsheet

In this example, we will select indigenous tree species that are documented to be used for edible fruit and bee forage (apiculture or honey production) and that are to be planted in an area that is within the vegetation type of moist intermediate forest.

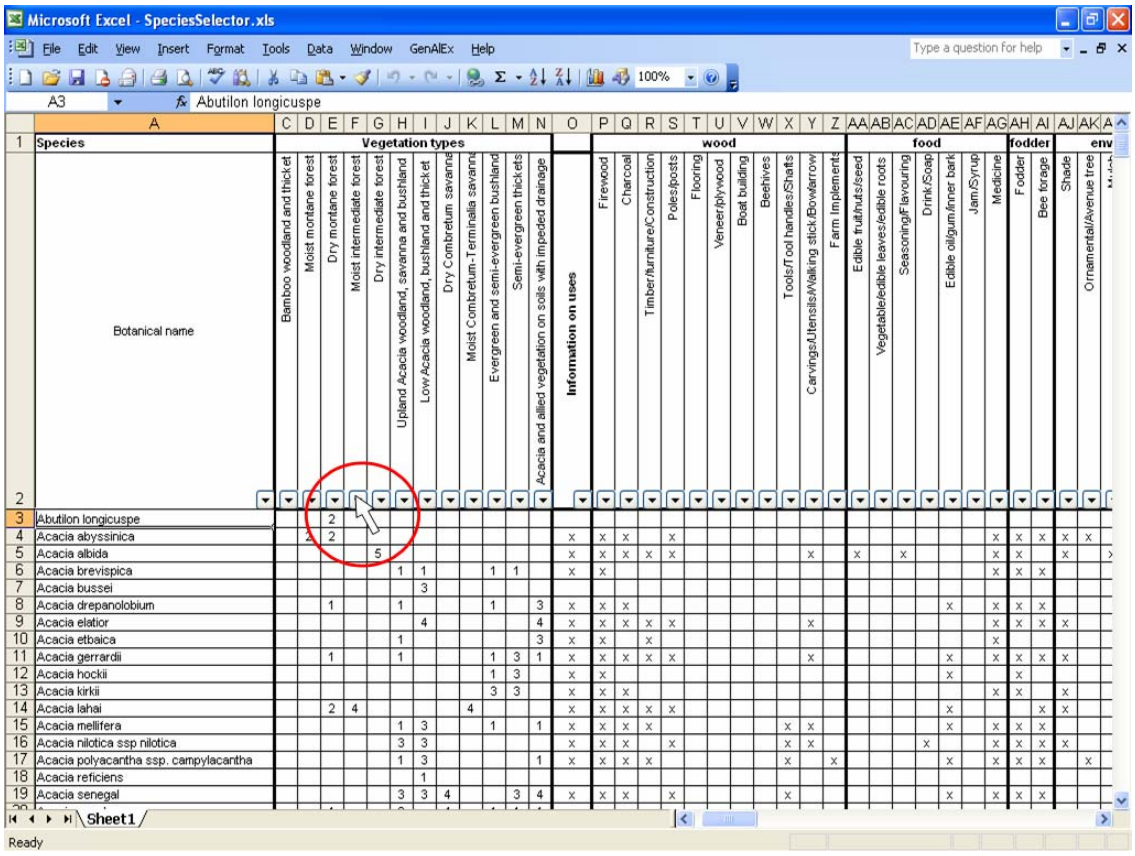
Step 1

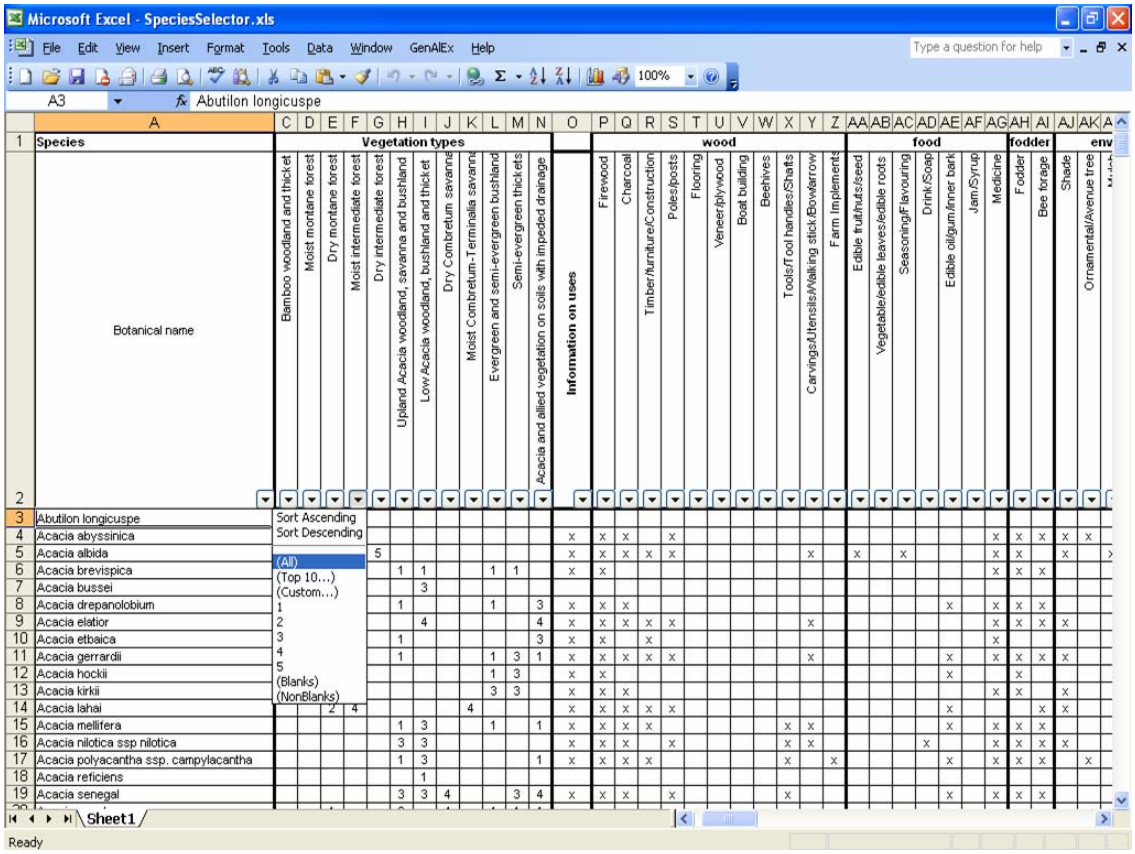
After opening the **SpeciesSelector.xls** spreadsheet, make sure that the *AutoFilter* option is switched on as shown here:



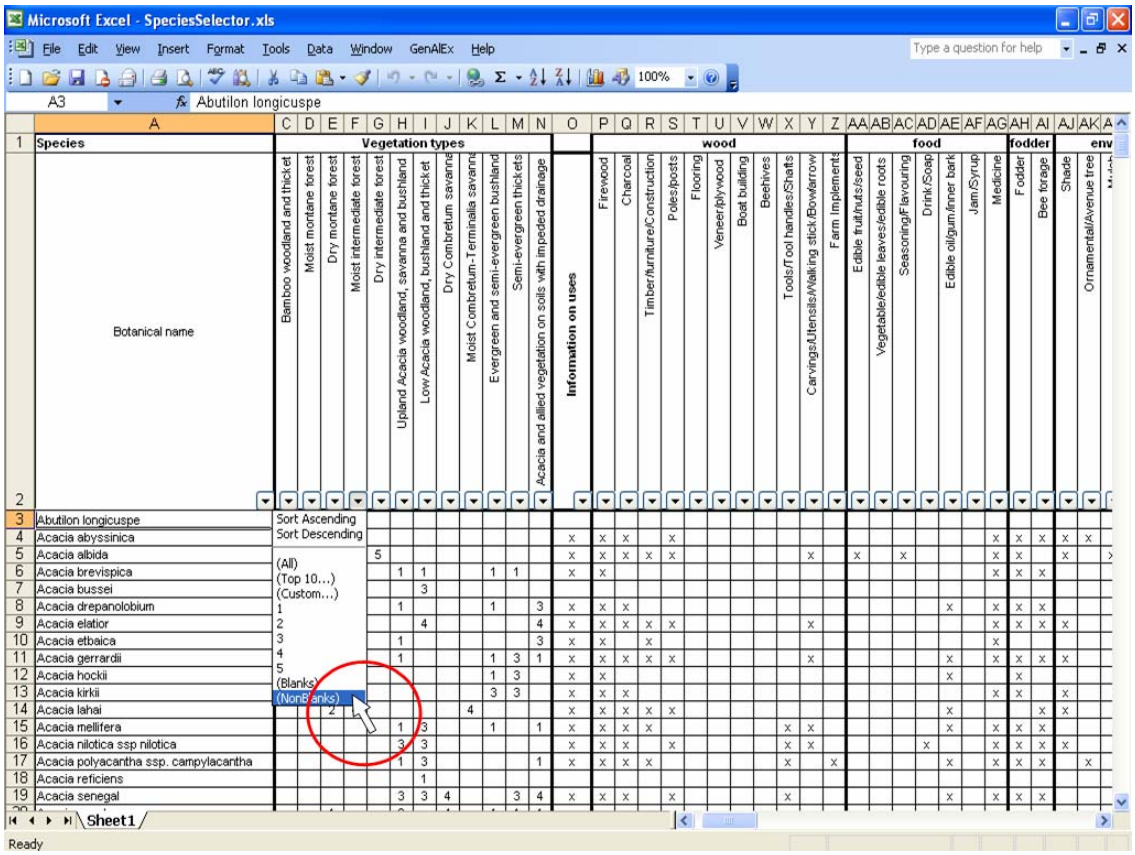
Step 2

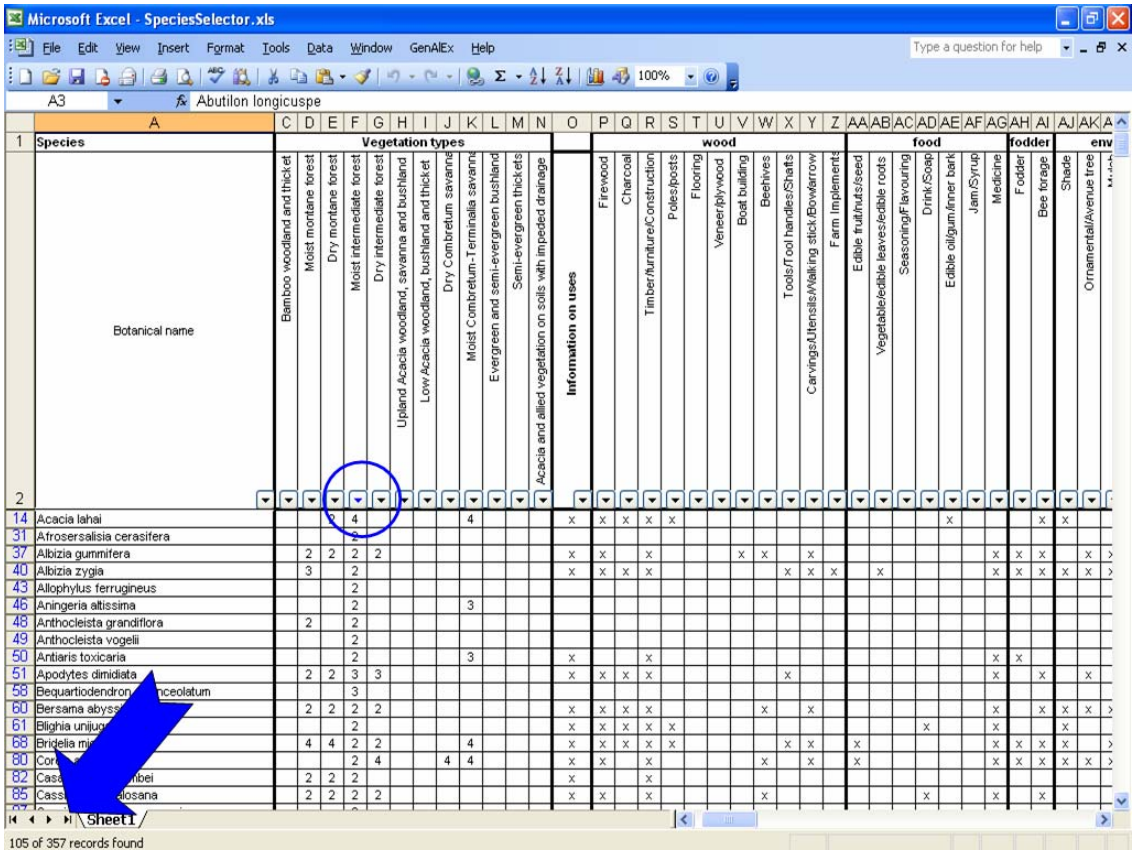
Next select species that occur in the potential natural vegetation type of moist intermediate forest. You can do this by clicking first on the arrow button corresponding to this vegetation type (the arrow button and red circle indicate where to click, the graph at the bottom of this page shows what happened after clicking):





Select the option of the 'NonBlanks' (the arrow button and red circle indicate where to click, the graph at the bottom of this page shows what happened after clicking):



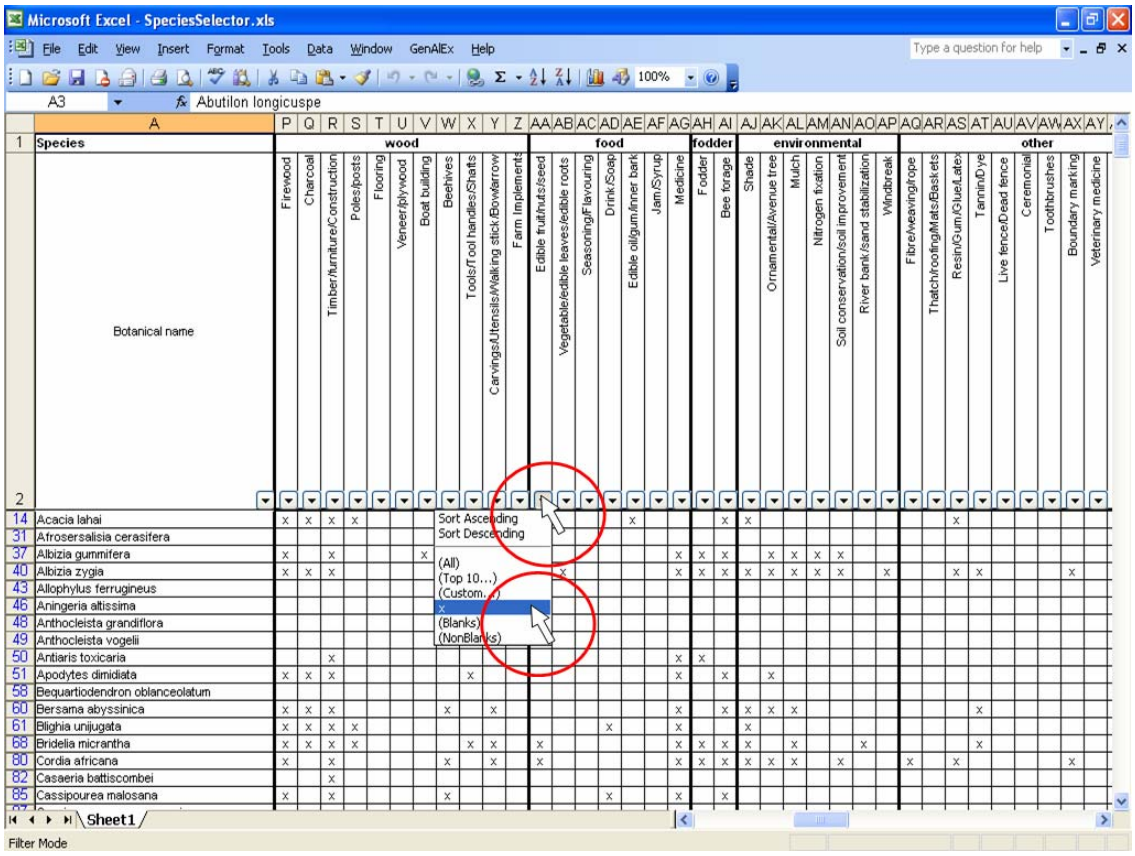


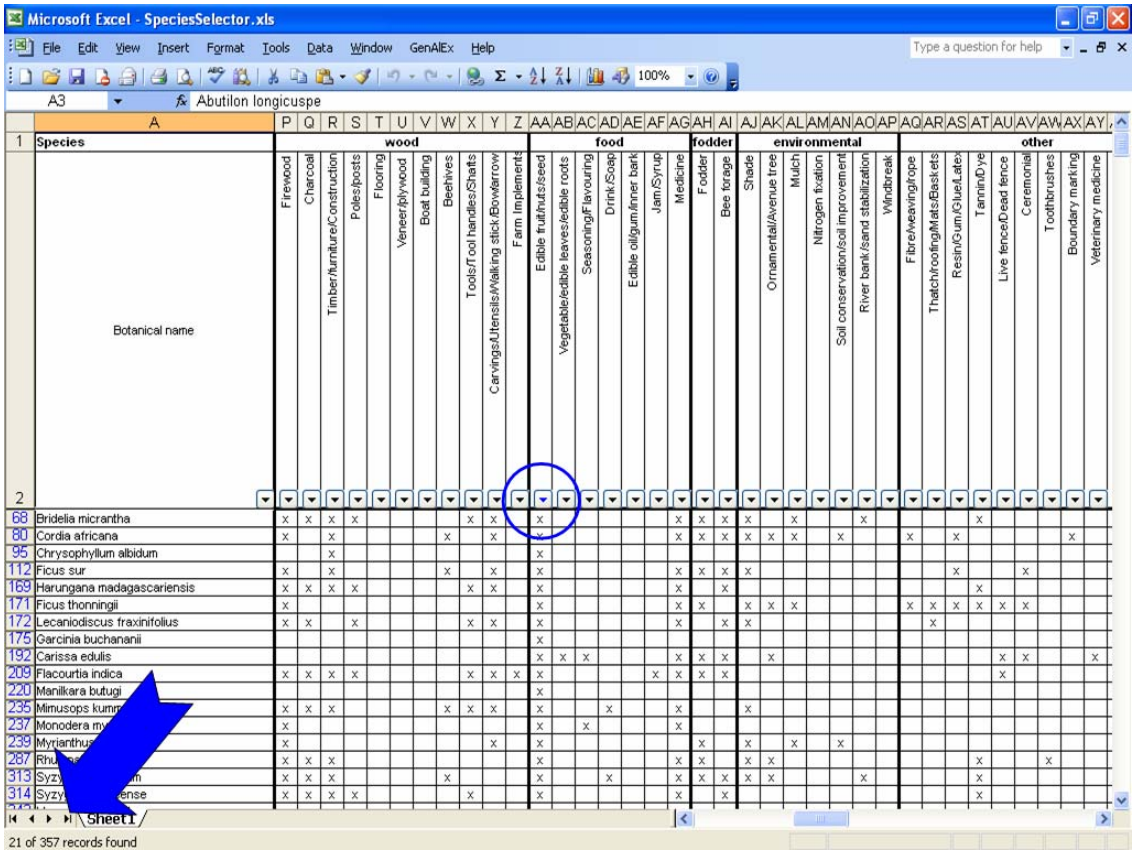
After having selected the subset of species, you should see that the colour selection button for the moist intermediate forest has changed to blue (see blue circle added on the graph above), that the colour of the selected row numbers (14, 31, 37, 40, ...) also changed to blue and a message will have appeared at the bottom of the spreadsheet of "105 of 357 records found" (see blue arrow at the bottom of the graph).

This first step of selecting species for a particular vegetation type has already been done for the Excel documents available in the **Species/VegetationLists/SpeciesSelectors** folder on the CD-ROM. These are the spreadsheets that are linked from the interactive htm version of the map (**GuideMapSheets.pdf**, available from the **MapSheets** folder on the CD-ROM).

Step 3

Next select species that are documented to be used for edible fruit by clicking on the arrow button in the column for 'edible fruit/nuts/seed' (main category of food). You can select the option of '×' or select the 'NonBlanks' for this category of food (the arrow buttons and red circles indicate where to click, the graph at the bottom of this page shows what happened after clicking):

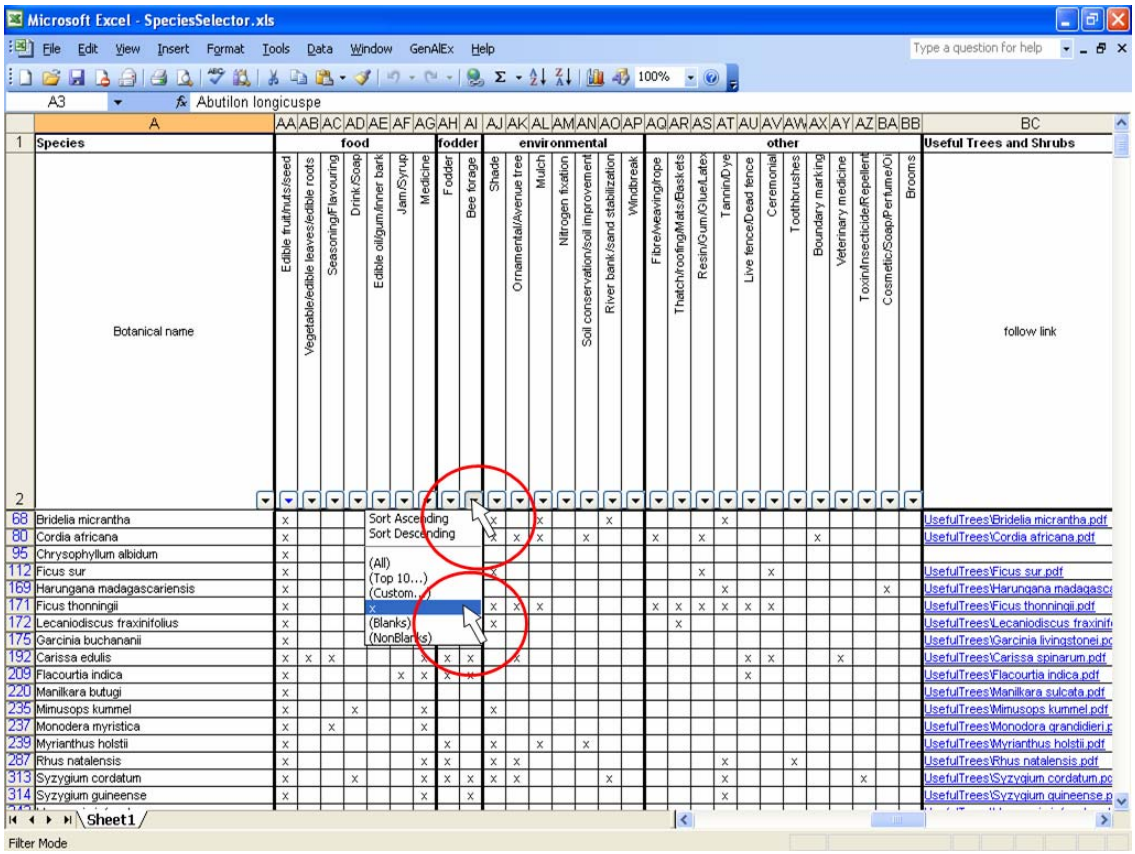


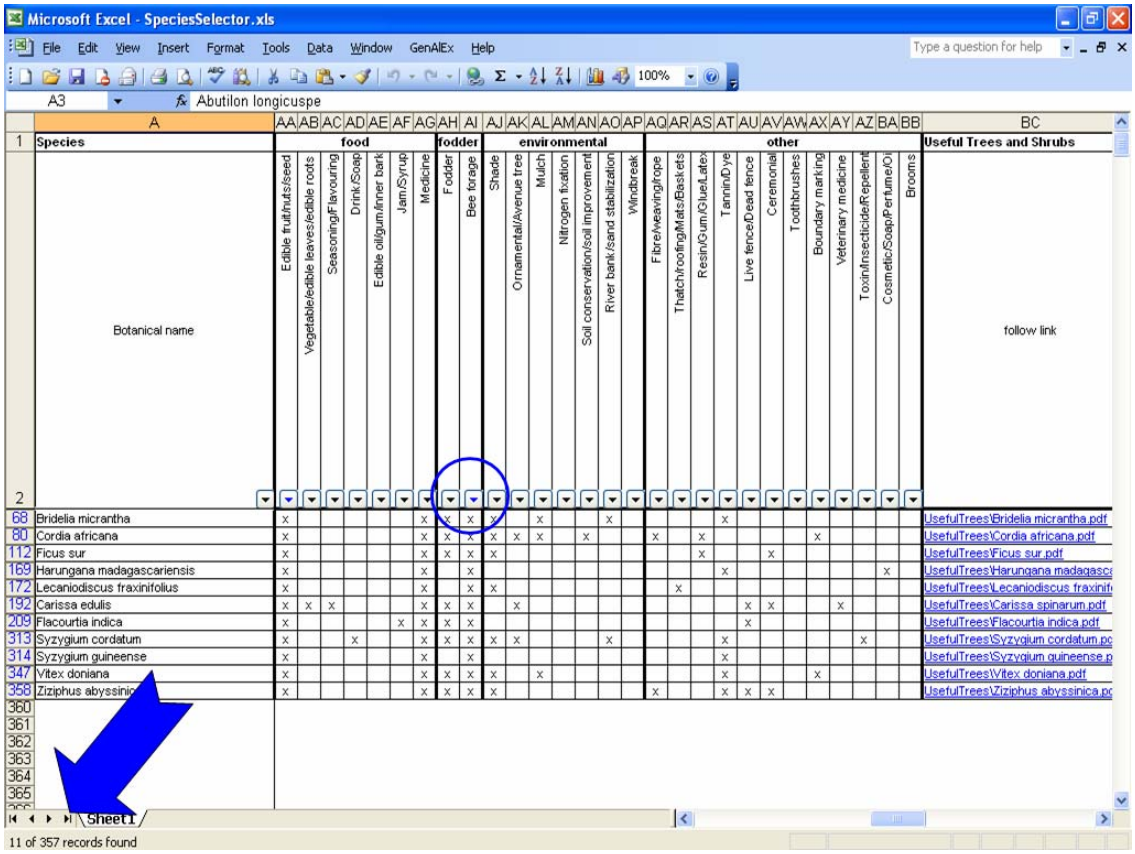


After having selected the subset of species, you should see that the colour selection button for the edible fruits/nuts/seeds has changed to blue (see blue circle added on the graph above) and a message will have appeared at the bottom of the spreadsheet of "21 of 357 records found" (see blue arrow).

Step 4

Use a similar procedure (clicking on the arrow and selecting the '×' or the 'NonBlanks') to select species that can be used for bee forage (the arrow button and red circle indicate where to click, the graph at the bottom of this page shows what happened after clicking):

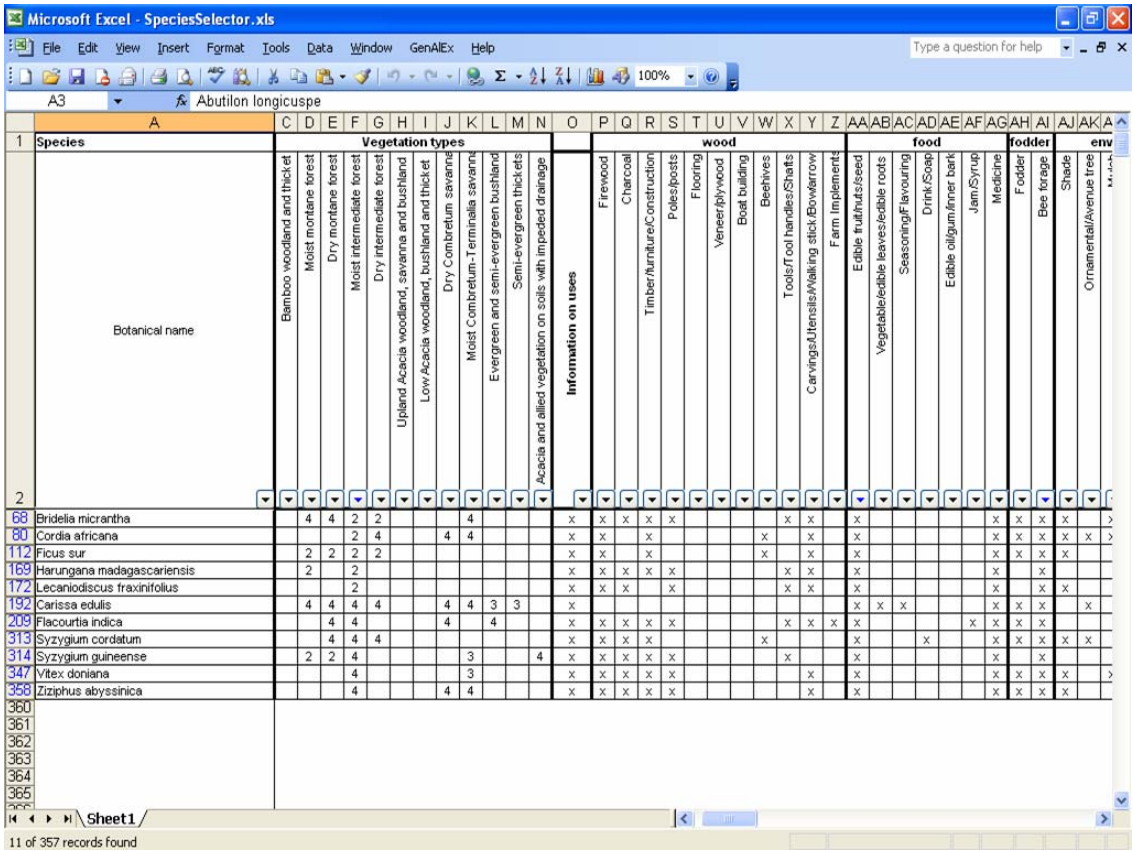




After having selected the subset of species, you should see that the colour selection button for the bee forage has changed to blue (see blue circle added on the graph above) and a message will have appeared at the bottom of the spreadsheet of "11 of 357 records found" (see blue arrow).

Step 5

Check for the rank of the selected species for the moist intermediate forest. As explained earlier, we have higher confidence in the suitability of species with smaller ranks:



From the graph above, you can see that you obtained the following 5 species of rank 2:

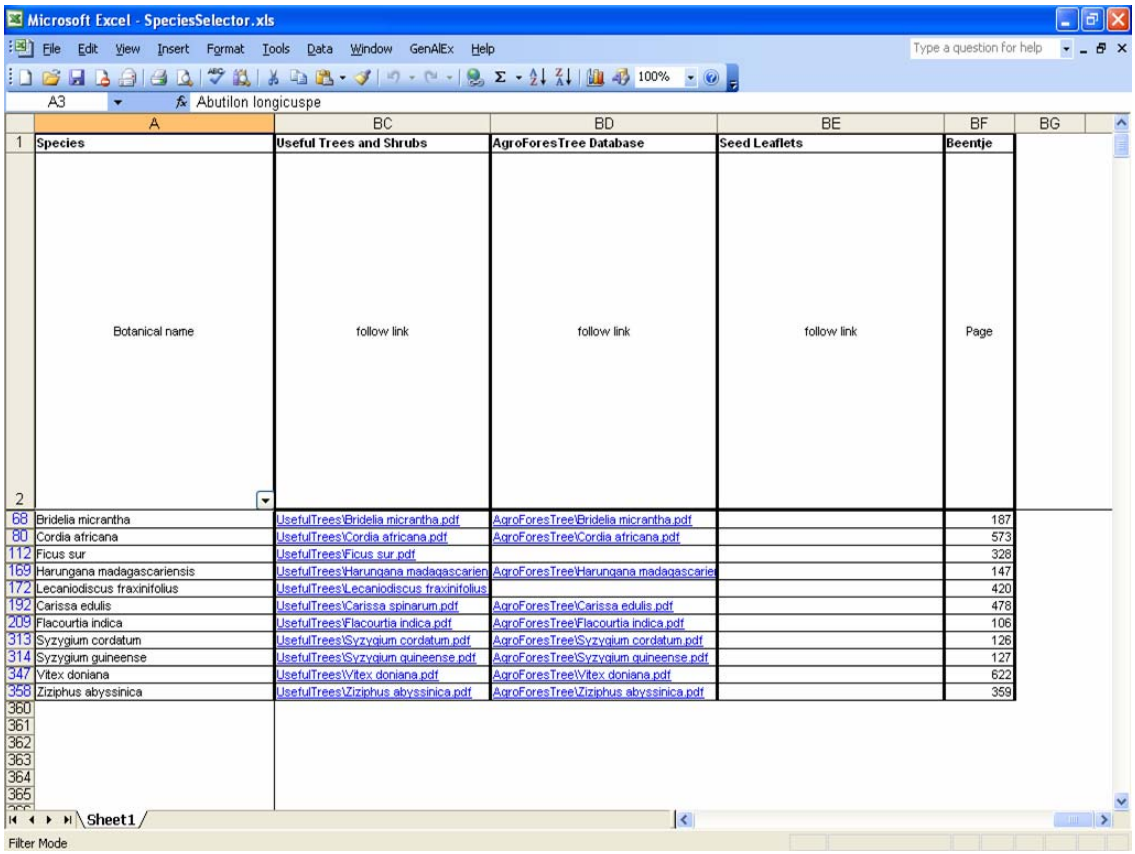
- *Bridelia micrantha*
- *Cordia africana*
- *Ficus sur*
- *Harungana madagascariensis*
- *Lecaniodiscus fraxinifolius*

… and the following 6 species of rank 4:

- *Carissa edulis*
- *Flacourtia indica*
- *Syzygium cordatum*
- *Syzygium guineense*
- *Vitex doniana*
- *Ziziphus abyssinica*

Step 6

Follow the links provided in columns at the right in Excel spreadsheet to obtain some additional information about these 11 species:



The final column of the spreadsheet shows the page number of the book by Henk Beentje on Kenyan Trees, Shrubs and Lianas.