Plant uses module - beta

Applies to v. 7.5.2 onwards

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Introduction

This document describes the BRAHMS plant uses module. In summary, the module allows you to:

- Develop a plant uses dictionary with major and minor use categories. A default uses list can be imported.
- Develop custom lookup lists for plant parts (bark, stems, *etc*.) and other relevant data types.
- Link uses and common names to taxa at the species or infra-specific level, assigning literature source links as available and adding further details such as the plant part used, a description of the use, its link to a geographic region and/or links to specimen vouchers if available. Note that common names can also be assigned to families as in 'The Olive family'.
- Import species, uses and literature references from RDE files.
- Add and edit plant uses and common names using the main species file form or directly in the main uses and common names dictionary.
- Add common names (not uses) via the main botanical records form.
- Text summaries of plant uses can be added to species and botanical records.
- Extract (query) taxa using any available method including some that directly related to what uses taxa have.
- In taxa extract files, format species uses into text fields that can subsequently be included in text reports which can be opened in word processors or other text editors.
- Add literature reference lists to such reports, embedded in the report or added as a numbered appendix.
- Calculate a range of statistics on species uses, for example, the number of different families, genera or species that have a particular use.

Excel transfers

For projects that have gathered significant data into Excel files, these data can also be processed into RDE format and thus transferred to BRAHMS. Note that wherever possible, it is preferable to enter the data direct to RDE, thus avoiding all the Excel to DBF steps.

Excel to DBF transfers are a general function in BRAHMS used where data have been provided in Excel. The function is found under **File > Get external data > Import Wizard**. Note that Excel files must first be saved as type Microsoft Excel 5.0/95.

Excel column headings should, as far as is possible, be the same as those used in RDE. This simplifies transfers and avoids heavy column renaming in RDE. In Excel, column headings should be 10 characters or less in width (the permitted max in DBFs).

X1 | ACFORNOTES

	K	L	M	N	O	P	Q	R	S	
	FAMILY	SPID	GENUS	SP1	AUTHOR1	RANK1	SP2	AUTHOR2	SYNONYMS	VEF
2	Leguminosae-pap	BOT1	*Abrus*	*precatorius*	*L.*					Mphethe, M
3	LEGUMINOSAE-	BOT2	Acacia	erioloba	E.Mey.					Nkosho, M
4	Leguminosae-mim	BOT3	*Acacia*	*erubescens*	*Oliv.*					Moloto
5	Leguminosae-mim	BOT4	*Acacia*	*fleckii*	*Schinz*					Mohahu
6	Leguminosae-mim	BOT5	*Acacia*	*hebeclada*	*DC.*	*subsp.*	*hebeclada*	*DC.*		Sekhi, Mok
7	LEGUMINOSAE-	BOT6	Acacia	karroo	Hayne					
8	LEGUMINOSAE-	BOT7	Acacia	kirkii	Oliv.	subsp.	kirkii	Oliv.		
9	Leguminosae-mim	BOT8	*Acacia*	*mellifera*	*(Vahl.) Benth.*					Mongana
10	LEGUMINOSAE-	BOT9	Acacia	nilotica	(L.) Delile	subsp.	kraussiana	(Benth.) Brenan		
11	Leguminosae-mim	BOT10	*Acacia*	*senegal*		*var.*	*rostrata*			

A	B	C	D	E	F	
TAG	DEL	REFID	CATEGORY	AUTHORS	YEAR	FULLTITLE
		BOT1	Book	Van Wyk, B.; Van Wyk, P.	1997	Field guide to trees of Southern Africa
		BOT2	Online database	Behr, K.	06/02/2014	Plantz Africa database
		BOT3	Traditional knowledge	Lecheng village elder		Interview of elders who came for a day escort at th
		BOT4	Traditional knowledge	Anonymous villager		Interview from a villager, -Toromoja, Boteti, Central, a
				Heath, A.; Heath R.; Goyder D. (eds.)		Field guide to the plants of Northern Botswana includ

Ideally, Excel file column headings should be the same as those used in RDE allowing simpler transfers to DBF, thus RDE and thus BRAHMS.

In relation to the plant uses module, Excel file worksheets can be transferred to RDE files of three different types.

- Taxa RDE file for species names
- Taxa RDE file with special fields for uses
- Biblio RDE file for literature

This process is not further discussed in this document.

RDE to BRAHMS

Species and references are added to BRAHMS using standard RDE import functions. Any non-standard fields are added to the BRAHMS species and Biblio link files.

Species uses do not have their own dedicated RDE file. Rather, they can be imported into an RDE type file with the following fields:

- country
- food
- animalfood
- medicines
- poisons
- materials
- fuels
- socialuse
- environuse
- weeds
- genesource

- plantpart
- extrainfo
- product
- animal

The uses data are transferred via a purpose transfer tool (in opened uses RDE file registered in Taxa RDE manager, choose **Tools > Import species uses data**.

species	bot	mex	mali	rsa	ken	kewnotes	accsiteid	accmatsit	kewstatus
Hypoxis hemerocallidea Fisch., C.A.Mey. & Avé-Lall.	*			*					
Jasminum fluminense Vell.	*								
Jatropha curcas L.	*	*	*						
Leucaena leucocephala (Lam.) de Wit	*	*							
Lippia javanica (Burm.f.) Spreng.	*			*					
Markhamia zanzibarica (Bojer ex DC.) K.Schum.	*								
Mimusops zeyheri Sond.	*								
Momordica balsamina L.	*		*						
Moringa oleifera Lam.	*		*						

Non- standard fields are added to the species link file and can be used to query taxa and/or include in reports.

Note that link fields can be used to tag and selected species for reporting. Thus, one could easily tag, query and report on all species with seed banked at the MSB.

Plant uses dictionary

The plant uses list is opened using **Taxa > Plant use dictionary.** The default list of uses can be imported from setup file using the Tools option provided. If the file is empty, you are prompted to import the default list.

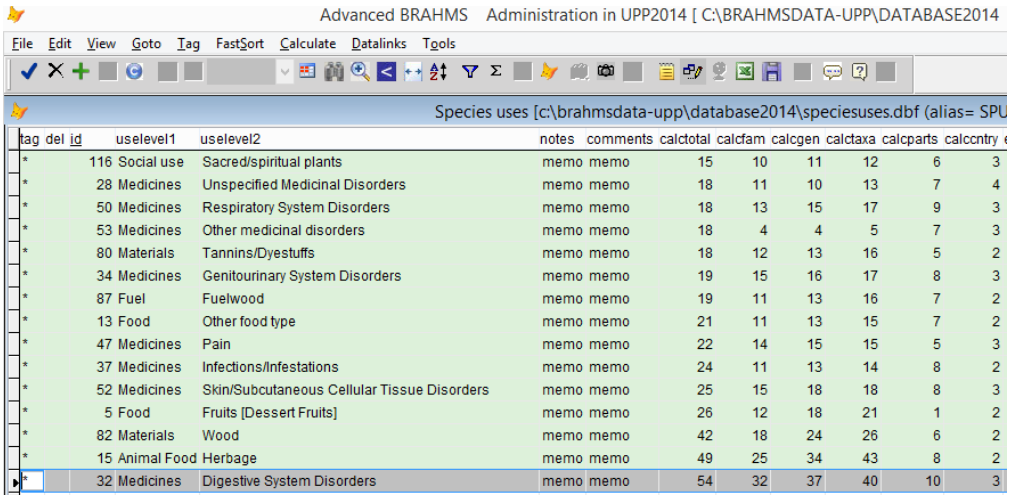
The use dictionary stress uses at 2 main levels (uselevel1 and uselevel2). This is a simple hierarchical arrangement where uselevel1 is parent to level2.

Record count	uselevel1
28	Medicines
26	Poisons
18	Materials
16	Animal Food
15	Food
14	Weed impact
14	Environmental use
13	Social use
10	Environment use
10	Gene Sources
8	Fuel

Summary of level 1 uses.

Use **Tools > Update calc fields** to update calculated stats on how uses are linked in the database. Options are provided for:

- Total number of links per use (CALCTOTAL).
- Number of different families, genera, taxa, plant parts and countries per use (CALCFAM, etc.)



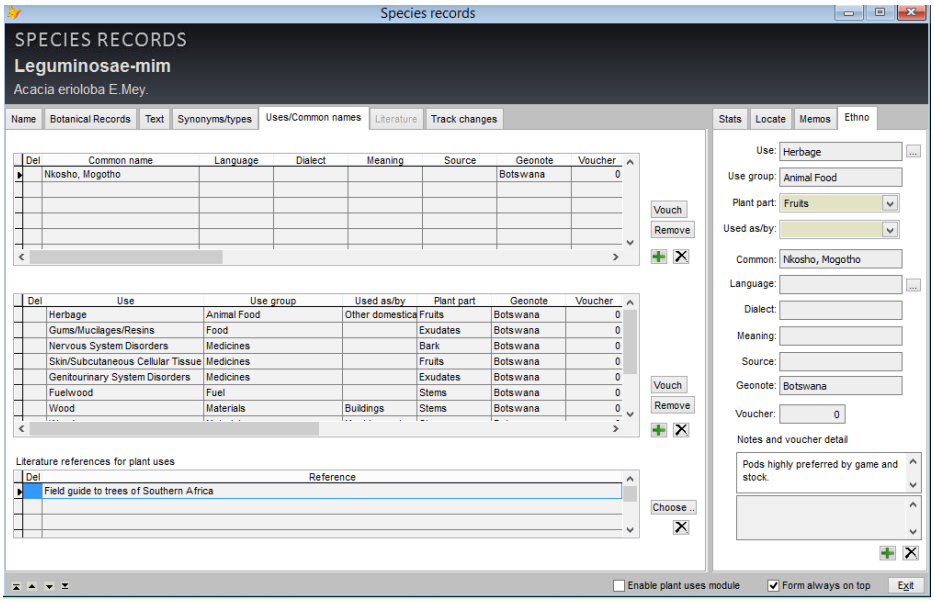
tag	del	id	uselevel1	uselevel2	notes	comments	calctotal	calcfam	calcgen	calctaxa	calcparts	calccntry
*		116	Social use	Sacred/spiritual plants	memo	memo	15	10	11	12	6	3
*		28	Medicines	Unspecified Medicinal Disorders	memo	memo	18	11	10	13	7	4
*		50	Medicines	Respiratory System Disorders	memo	memo	18	13	15	17	9	3
*		53	Medicines	Other medicinal disorders	memo	memo	18	4	4	5	7	3
*		80	Materials	Tannins/Dyestuffs	memo	memo	18	12	13	16	5	2
*		34	Medicines	Genitourinary System Disorders	memo	memo	19	15	16	17	8	3
*		87	Fuel	Fuelwood	memo	memo	19	11	13	16	7	2
*		13	Food	Other food type	memo	memo	21	11	13	15	7	2
*		47	Medicines	Pain	memo	memo	22	14	15	15	5	3
*		37	Medicines	Infections/Infestations	memo	memo	24	11	13	14	8	2
*		52	Medicines	Skin/Subcutaneous Cellular Tissue Disorders	memo	memo	25	15	18	18	8	3
*		5	Food	Fruits [Dessert Fruits]	memo	memo	26	12	18	21	1	2
*		82	Materials	Wood	memo	memo	42	18	24	26	6	2
*		15	Animal Food	Herbage	memo	memo	49	25	34	43	8	2
*		32	Medicines	Digestive System Disorders	memo	memo	54	32	37	40	10	3

The species uses dictionary can be imported from the Kew standard list or developed independently. Tools are provided to update species use totals, for example, how many different families a use is found across. This example is sorted on the field CALCTOTAL. Digestive System Disorders seem to be well treated or reported…

When compiling formatted plant use reports in the taxa extract file, it is also possible to restrict to tagged uses. This offers flexibility with creating different types of report.

Species form uses tab

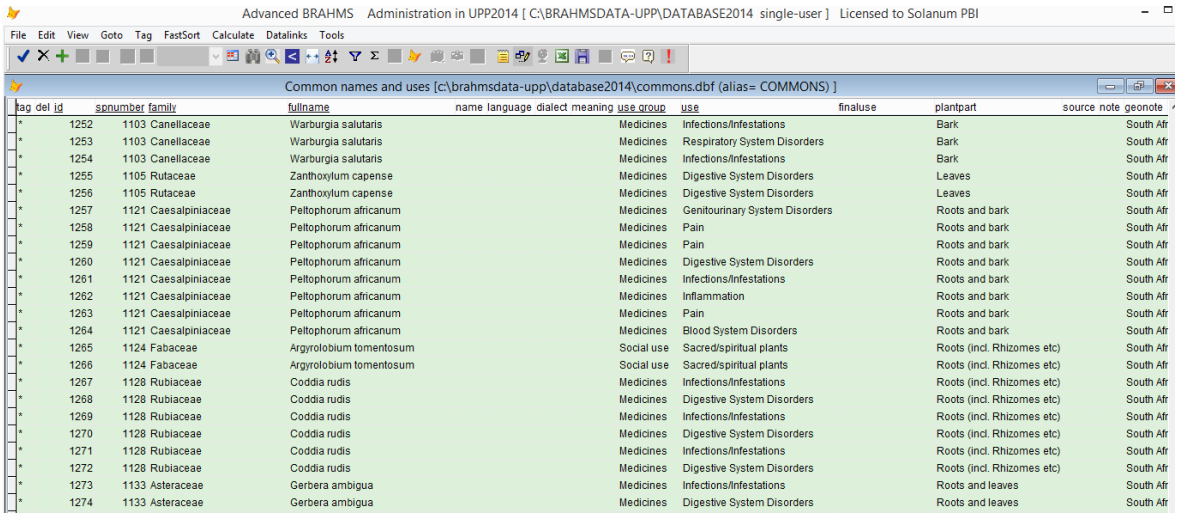
The species main data entry/edit form now separates common names and uses and has been further tidied up. Uses and common names can be linked textually to a geotext entry (in your case country) or optionally linked via a voucher. Voucher links are no longer obligatory.



The main species form Uses/Common names tab provides options to add and remove uses and/or common names, linking these to literature references as available.

Main uses and common names file

All use and common name links are stored and can be viewed/edited directly in the main species – uses+common names file opened with **Taxa > Uses and common names**.



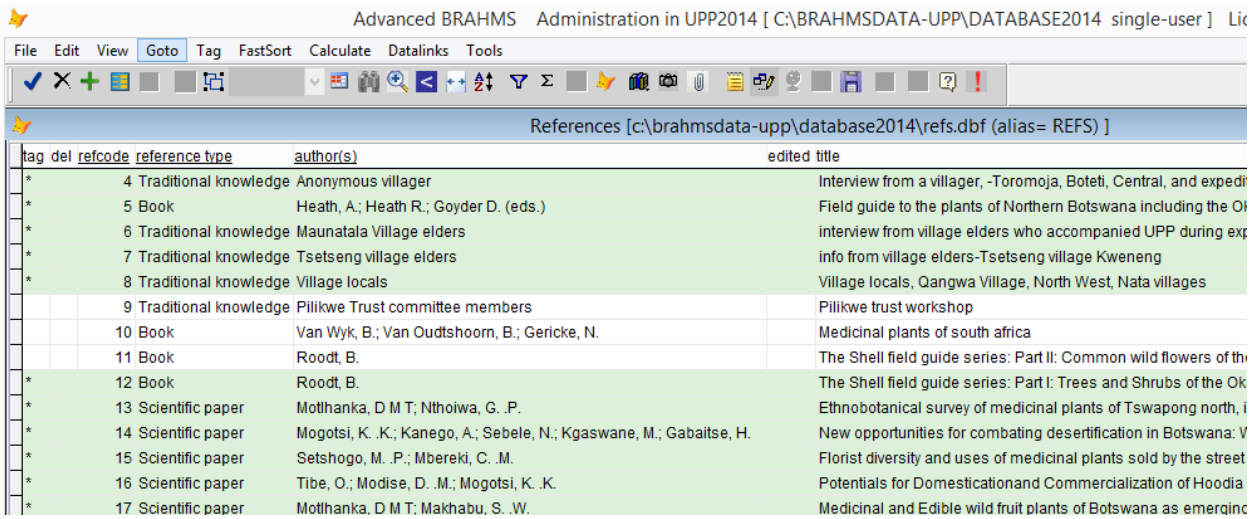
tag	del	id	spnumber	family	fullname	name language	dialect meaning	use group	use	finaluse	plantpart	source note	geonote
*		1252	1103	Canellaceae	Warburgia salutaris			Medicines	Infections/Infestations		Bark		South Afr
*		1253	1103	Canellaceae	Warburgia salutaris			Medicines	Respiratory System Disorders		Bark		South Afr
*		1254	1103	Canellaceae	Warburgia salutaris			Medicines	Infections/Infestations		Bark		South Afr
*		1255	1105	Rutaceae	Zanthoxylum capense			Medicines	Digestive System Disorders		Leaves		South Afr
*		1256	1105	Rutaceae	Zanthoxylum capense			Medicines	Digestive System Disorders		Leaves		South Afr
*		1257	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Genitourinary System Disorders		Roots and bark		South Afr
*		1258	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Pain		Roots and bark		South Afr
*		1259	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Pain		Roots and bark		South Afr
*		1260	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Digestive System Disorders		Roots and bark		South Afr
*		1261	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Infections/Infestations		Roots and bark		South Afr
*		1262	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Inflammation		Roots and bark		South Afr
*		1263	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Pain		Roots and bark		South Afr
*		1264	1121	Caesalpiniaceae	Peltophorum africanum			Medicines	Blood System Disorders		Roots and bark		South Afr
*		1265	1124	Fabaceae	Argyrolobium tomentosum			Social use	Sacred/spiritual plants		Roots (incl. Rhizomes etc)		South Afr
*		1266	1124	Fabaceae	Argyrolobium tomentosum			Social use	Sacred/spiritual plants		Roots (incl. Rhizomes etc)		South Afr
*		1267	1128	Rubiaceae	Coddia rudis			Medicines	Infections/Infestations		Roots (incl. Rhizomes etc)		South Afr
*		1268	1128	Rubiaceae	Coddia rudis			Medicines	Digestive System Disorders		Roots (incl. Rhizomes etc)		South Afr
*		1269	1128	Rubiaceae	Coddia rudis			Medicines	Infections/Infestations		Roots (incl. Rhizomes etc)		South Afr
*		1270	1128	Rubiaceae	Coddia rudis			Medicines	Digestive System Disorders		Roots (incl. Rhizomes etc)		South Afr
*		1271	1128	Rubiaceae	Coddia rudis			Medicines	Infections/Infestations		Roots (incl. Rhizomes etc)		South Afr
*		1272	1128	Rubiaceae	Coddia rudis			Medicines	Digestive System Disorders		Roots (incl. Rhizomes etc)		South Afr
*		1273	1133	Asteraceae	Gerbera ambigua			Medicines	Infections/Infestations		Roots and leaves		South Afr
*		1274	1133	Asteraceae	Gerbera ambigua			Medicines	Digestive System Disorders		Roots and leaves		South Afr

The main uses and common names file provides direct editing access and also provides some additional Tools options, for example to tag all species based on tagged uses.

Uses in this dictionary can be selectively tagged and these tags copied to the main species file. This is useful to build reports on particular uses or groups of uses.

Literature

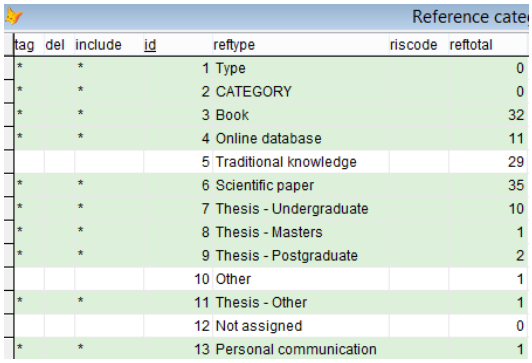
References of different categories are stored in the main references file opened using **Biblio > View/edit references in database**. References categories are stored and can be edited using **Biblio > Resource files > Publication categories**.



tag	del	refcode	reference type	author(s)	edited	title
*		4	Traditional knowledge	Anonymous villager		Interview from a villager, -Toromoja, Boteti, Central, and expedi
*		5	Book	Heath, A.; Heath R.; Goyder D. (eds.)		Field guide to the plants of Northern Botswana including the Ok
*		6	Traditional knowledge	Maunatala Village elders		interview from village elders who accompanied UPP during exp
*		7	Traditional knowledge	Tsetseng village elders		info from village elders-Tsetseng village Kweneng
*		8	Traditional knowledge	Village locals		Village locals, Qangwa Village, North West, Nata villages
		9	Traditional knowledge	Pilikwe Trust committee members		Pilikwe trust workshop
		10	Book	Van Wyk, B.; Van Oudtshoorn, B.; Gericke, N.		Medicinal plants of south africa
		11	Book	Roodt, B.		The Shell field guide series: Part II: Common wild flowers of th
*		12	Book	Roodt, B.		The Shell field guide series: Part I: Trees and Shrubs of the Ok
*		13	Scientific paper	Motlhanka, D M T; Nthoiwa, G. .P.		Ethnobotanical survey of medicinal plants of Tswapong north, i
*		14	Scientific paper	Mogotsi, K. .K.; Kanego, A.; Sebele, N.; Kgaswane, M.; Gabaitse, H.		New opportunities for combating desertification in Botswana: V
*		15	Scientific paper	Setshogo, M. .P.; Mbereki, C. .M.		Florist diversity and uses of medicinal plants sold by the street
*		16	Scientific paper	Tibe, O.; Modise, D. .M.; Mogotsi, K. .K.		Potentials for Domesticationand Commercialization of Hoodia
*		17	Scientific paper	Motlhanka, D M T; Makhabu, S. .W.		Medicinal and Edible wild fruit plants of Botswana as emerginc

Snapshot view of main references file.

Each reference is numbered and when citing literature in reports, these numbers can be used to replace the title. The INCLUDE field in the publication category file can be used to include/exclude references by category from reports. For example, you may wish to exclude less formal sources such as 'Traditional knowledge'.



Reference cate

tag	del	include	id	reftype	riscode	reftotal
*		*	1	Type		0
*		*	2	CATEGORY		0
*		*	3	Book		32
*		*	4	Online database		11
			5	Traditional knowledge		29
*		*	6	Scientific paper		35
*		*	7	Thesis - Undergraduate		10
*		*	8	Thesis - Masters		1
*		*	9	Thesis - Postgraduate		2
			10	Other		1
*		*	11	Thesis - Other		1
			12	Not assigned		0
*		*	13	Personal communication		1

The literature types file has an INCLUDE field which allows you to selectively include/exclude categories of literature from reports.

When formatting uses (see below) and you select the option to use reference number, all relevant references are listed to the file 'referencelist.txt' - the location of the file is reported after formatting.

Extracting/querying taxa

Reports that include formatted uses, as with other types of species based reports (checklists, taxonomic revision outputs and similar) are prepared from the taxa extract file. Taxa are extracted using **Taxa > Extract/query data**. The choice of extract method will depend on which names you wish to report on.

If your database includes synonyms, you may want to restrict the query to accepted names only. You can do this using the Name status option on the query form if your accepted names are marked 'acc' in the TAXSTAT field. Bear in mind that in any case, synonyms can be formatted under your list of accepted names.

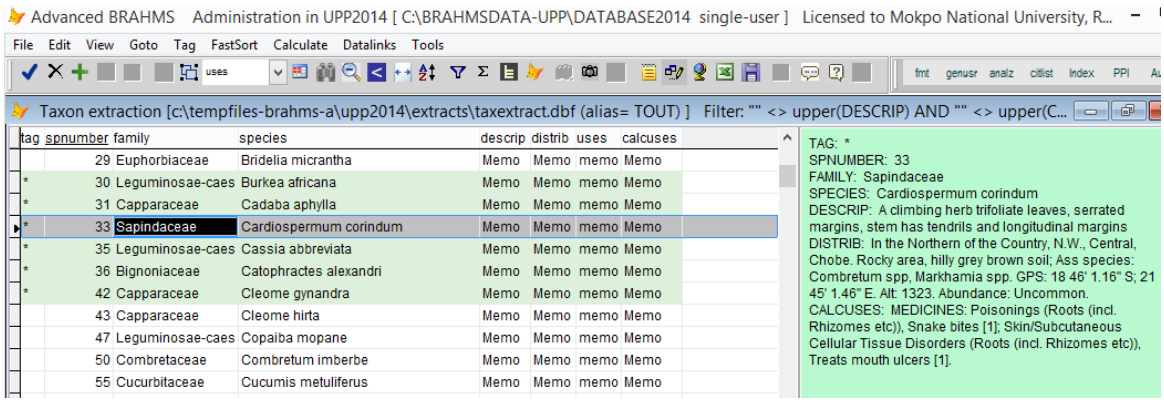
Extracting by tagged species is very flexible as you can first tag records in your main species file using a multitude of options. There are also Tools options in the main uses and common names file to transfer tags to the main species file. Thus by combining filters and tag options, you could easily tag species with a special set of known uses and then query on these.

In the taxa extract file, you can use Tools options to format in various features including, as discussed below, species uses. For further details of formatting and text reporting, refer to the documents:

http://herbaria.plants.ox.ac.uk/bol/Content/Groups/brahms/Resources/Taxonomic_accounts.pdf

http://herbaria.plants.ox.ac.uk/bol/Content/Groups/brahms/Resources/Textreporting.pdf

Bear in mind that, as with any other file, you can define field views in taxa extract files to show a convenient selection of fields. Use the toolbar.



A field view showing a selection of taxa extract file fields.

Formatting uses for reports

All use formatting is carried out in the taxa extract file. Thus, the typical steps to create a report are:

- Extract the taxa to report on using one of several methods.
- Use the plant uses formatting tools provided to populate the taxa extract file CALCUSES memo.
- Use text reporting to generate the formatted text report.

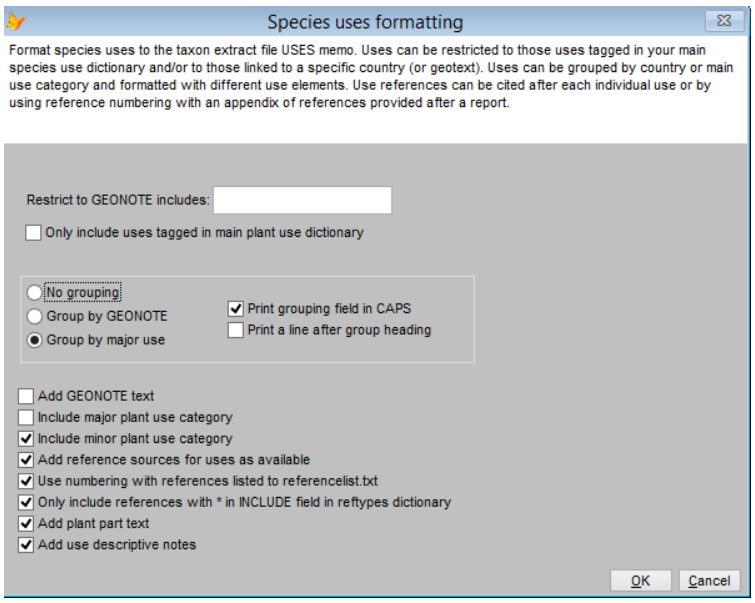
In the opened taxa extract file, the formatting tools for uses is opening using **Tools > Formatting for text reports > Species uses to CALCUSES**.

Note that CALCUSES is a temporary field only found in taxa extract files. You can store a permanent summary of uses in the species file memo field USES. The formatted content of CALCUSES can be used to help prepare the USES text.

Text report components are all highly 'formattable' – the examples given here are simply examples of a potentially limitless range of reporting styles.

It is possible to exclude uses and/or their references that are not tagged in the reference category file INCLUDE field – see **Biblio > Resource files > Publication categories**. Uses can also be restricted to those in a selected country or geo-zone. Uses can also be restricted to species uses that are tagged in the main species use dictionary.

Uses can be groups by geography or my major use category. When formatting reports, you can define which elements to include (geography, use name, plant part, notes, *etc.*)



Uses are formatted in the taxa extract file using the species uses formatting tools. The resulting USES memo can then be added to a BRAHMS text report.

Formatted uses examples

Example 1. Uses grouped by major use type.

FOOD: Food additives (Unspecified parts), condimentos, Mexico [12]; Other food type (Unspecified parts), botanas, Mexico [12]; Unspecified Food (Unspecified parts), alimento, Mexico [12].

MATERIALS: Alcohols (Unspecified parts), Brebajes alcoholicos, Mexico [12].

MEDICINES: Abnormalities (Aerial parts), medicina fiebre, Mexico [12]; Circulatory System Disorders (Aerial parts), Medicina baños de asiento, Mexico [12]; Digestive System Disorders (Aerial parts), medicina Tos, Mexico [12]; Infections/Infestations (Aerial parts), medicina problemas intestinales, Mexico [11]; Inflammation (Unspecified parts), medicina inflamacion, Mexico [11]; Injuries (Aerial parts), medicina heridas, Mexico [12]; Muscular-Skeletal System Disorders (Unspecified parts), medicina espasmos, Mexico [12]; Pain (Unspecified parts), medicnina dolor, Mexico [12]; Pregnancy/Birth/Puerpuerium Disorders (Unspecified parts), Probocar aborto, Mexico [12]; Respiratory System Disorders (Aerial parts), medicina problemas respiratorios, Mexico [12]; Skin/Subcutaneous Cellular Tissue Disorders (Aerial parts), medicina granos, Mexico [12].

Example 2. Uses grouped by major use type but restricted to uses that include the word 'disorder'.

MEDICINES: Circulatory System Disorders (Aerial parts), Medicina baños de asiento [12]; Digestive System Disorders (Aerial parts), medicina Tos [12]; Muscular-Skeletal System Disorders (Unspecified parts), medicina espasmos [12]; Pregnancy/Birth/Puerpuerium Disorders (Unspecified parts), Probocar aborto [12]; Respiratory System Disorders (Aerial parts), medicina problemas respiratorios [12]; Skin/Subcutaneous Cellular Tissue Disorders (Aerial parts), medicina granos [12].

Example 3. A text report with a few more fields added

LEGUMINOSAE-MIM

Acacia senegal **var.** *rostrata*
Description:-3m tall tree with smooth grey bark peeling out to reveal yellow/ straw papery bark, 3 prickles at each node, 2 pointed and 1 hooked. **Distribution:-**N.W.C. of the country, in a mopane woodland mixed with Acacias and grassland, white limestone soils. GPS: 21 17' 5.00" S; 25 11' 0.17" E. Alt: 955. Abundance: Uncommon. **Uses:-**ANIMAL FOOD: Herbage (Leaves), Black Rhino, Botswana [1]; FOOD: Gums/Mucilages/Resins (Exudates), Botswana [5]; MATERIALS: Gums/Resins (Exudates), Botswana [12].

MALVACEAE

Azanza garckeana **(F.Hoffm.) Exell & Hillc.**
Description:-A shrub of about 4m with hairy leaves which are feint green in colour underneath, Entire margins, Bark greyish and smooth, Leaves are large,3-5 lobed, broad and veined from the base. **Distribution:-**Found in many parts of Botswana, grows on loam soils. Open woodland, clay-loamy soils exposed to full sun, Spread throughout the country, except for the deep sand areas as kgalagadi. **Uses:-**ANIMAL FOOD: Flowers (Flowers), Botswana, ; Herbage (Leaves), Game and livestock, Botswana, ; ENVIRONMENT USE: Agroforestry (Entire plant), Botswana [13]; Ornamentals (Entire plant), Botswana, ; Shade/Shelter (Entire plant), Botswana [21]; Soil improvers (Leaves), Botswana, ; FOOD: Food additives (Fruits), Makes jelly, Botswana [1]; Gums/Mucilages/Resins (Fruits), Botswana [12]; Vegetables (Leaves), Botswana [5]; FUEL: Charcoal (Stems), Botswana [12]; Fuelwood (Stems), Botswana [1]; MATERIALS: Fibres (Bark), Botswana [21]; Wood (Stems), Botswana [12].

1. Van Wyk, B.; Van Wyk, P. (1997). FIELD GUIDE TO TREES OF SOUTHERN AFRICA. Not given [Book] 5. Heath, A.; Heath R.; Goyder D. (eds.) (2009). FIELD GUIDE TO THE PLANTS OF NORTHERN BOTSWANA INCLUDING THE OKAVANGO DELTA. Not given: 1-588 [Book] 12. Roodt, B. (1998). THE SHELL FIELD GUIDE SERIES: PART I: TREES AND SHRUBS OF THE OKAVANGO DELTA. MEDICINAL USES AND NUTRITIONAL VALUE.. Not given: 1-224 [Book] 13. Motlhanka, D M T; Nthoiwa, G. .P. (2013). ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS OF TSWAPONG NORTH, IN EASTERN BOTSWANA: A CASE OF PLANTS FROM MOSWUE AND SEOLWANE VILLAGES. Not given [Scientific paper] 21. Mojeremane, W.; Legwaila, G. .M.; Mogotsi. K. K.; Tshwenyane, S. .O. (2005). MONEPENEPE (CASSIA ABBRIVIATA): A MEDICINAL PLANT IN BOTSWANA. International Journal of Botswana 1(2): 108-110 [Scientific paper]

Reference appendix example

References can be formatted in different ways using further format control options. A simple example:

1. Van Wyk, B.; Van Wyk, P. (1997). FIELD GUIDE TO TREES OF SOUTHERN AFRICA. Not given [Book]

2. Behr, K. (6). PLANTZ AFRICA DATABASE. Not given [Online database]

3. Lecheng village elder INTERVIEW OF ELDERS WHO CAME FOR A DAY ESCORT AT THE EXPEDITION- LECHENG VILLAGE. Not given [Traditional knowledge]

4. Anonymous villager INTERVIEW FROM A VILLAGER, -TOROMOJA, BOTETI, CENTRAL, AND EXPEDITION GUIDE (ELDER) IN LECHENG, TSWAPONG, CENTRAL. Not given [Traditional knowledge]

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