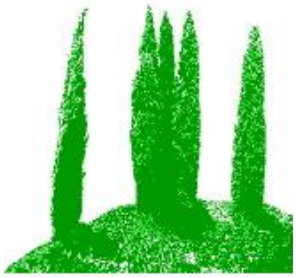


Hdb2Win

Programme Release 2.6 (March 2025)

Content

1 Introduction

1.1 Concept

Hdb2Win is a para-relational database system that dates back to the early 1990s. It was developed – together with the first and for several years only application PaleoTax – to record taxonomic data in palaeontology. In 2001 the Windows version was published. In earlier versions of Hdb2Win, the database and the only application were more closely interconnected. Later, this concept was modified so that other applications (menu driven, easily to operate) could be developed, in order to work with the kernel of Hdb2Win.

Because PaleoTax was the primary goal for many years, it named the whole system (and the Internet page), even if several other applications now exist. Hdb2Win uses the dBase III format for the data and the ASCII format for parameter files and it is therefore an open system that allows migration, in both directions. Hdb2Win itself is solely a database engine with a command line, an interpreter, and an application module. To be able to make use of the application module, an application must exist that encompasses a data structure (e.g. the tables, the describing parameter and data acquisition form files that are created when a new table is created using the system) and, optionally, programmes for data analysis and output. The applications are independent of Hdb2Win and do not form part of the programme kernel.

Applications can be created by you (there is a methodology cookbook available in PDF), but a comfortable application that offers many options (i.e. programmes for data analysing, text and graphics output) requires skills, time and patience. A good knowledge of the interpreter is necessary (there is also a detailed manual available).

1.2 Installation

Any application is installed together with the Hdb2Win programme package (see www.paleotax.de for more information). Just be aware to mark the correct application when you are asked which additional packages you wish to install. If you want to plot occurrences, the box labelled with ‘PaleoTax/Map’ should also be marked. When working with vector graphics (PaleoTax, Oliva), PaleoTax/Graph should be installed. For the installation, you probably need to have Administrator Rights.

On high definition or UHD screens it is necessary to set the properties of Hdb2Win correctly. Right-click on the symbol on the desktop, select Properties > Compatibility > Change high DPI settings. Here in the bottom box, mark the check box and select "Application" or mark the box "Disable Display Scaling on High DPI Settings ".

When after starting all buttons (except Quit) are disable, please compare to the following errors (an error message appears above the buttons):

Error	Description
1	Cannot set the programme folder. This is necessary to read various files.
2	Cannot start HSERR library (memory error).
3	Cannot read messages.
4	Cannot read error messages of the library NPSCAN.
6	Cannot read error messages of the library HDDEF.
7	Start of the library HDSYM failed.
8	Start of the library HDUSE failed.
9	Cannot read error messages of the library TCV20W.
10	Cannot read error messages of the library HDCOM.
11	Start of the library HDFORM failed.
12	Cannot read error messages of the library PALEOTAX.
13	Screen size insufficient.

14	Variable LASTERROR cannot be created.
31	Error reading settings : file not found.
32	Error reading settings : could not set value.
34	Error reading settings : name could not be obtained.
35	Error reading settings : cannot read value.

When the application library is started for the first time with Hdb2Win 2.6.0, the font menu will appear. Font types, font size, the height of buttons, and the distance of items in lists are now defined globally. Make here your preferred settings. You can always make this setting though Application library > Options > Display > Adapt fonts.

When you have successfully passed these settings and select the language and then ‘Application library’. In the list on the left side of the form you will see the installed data structures. It is not possible to open them. You need to clone the structure. To do so, mark it, click on ‘New’ and follow the instructions as described below. A new empty database will be created for you. This database will now appear in the list and can be opened.

If you intend to work with PaleoTax or Oliva (that both make a use of PaleoTax/Graph) you should calibrate the font size. Compare to the manual of PaleoTax Graph, version 2.6, Font size calibration.

2 Data structure

A database is a complex compound structure of tables (such as a spreadsheet) that are interconnected with each other. The structure of the database (which tables are used, how they are interconnected) depends on the rules of the relational data model, on the one hand, and on the focus of the database, on the other hand. The database is scalable, which means that you may modify the structure, e.g. enlarge it. **It is not recommendable to remove data fields, to rename them, or to change their attributes**; this will cause errors. The start screen (Figure 2.1) shows the principal tables, which are those tables that are usually searched.

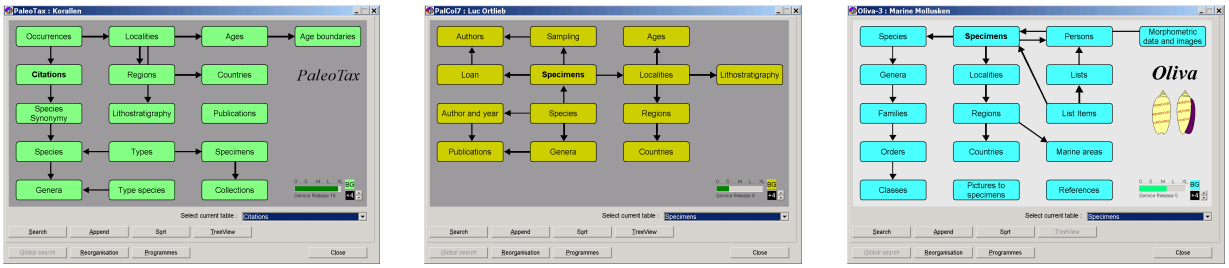


Figure 2.1. Start screen of the published database applications. The size of the form can be modified. With the right bottom arrows, the font size in the boxes can be increased. The small top panel modifies the background colour of the tables. The small bottom panel changes the colour of the active table. The number in the bottom panel gives the difference to the standard programme font size. The colour of the gauge may change from green to purple and indicates the need for reorganisation.

Each table has data fields that may represent characters, numbers, dates, a logical status, or interconnections with other tables. Since the tables are interconnected with each other, records can be edited or appended with respect to tables that are interconnected with the current table. Each table has a data acquisition form. This form always has the same structure (Figure 2.2).

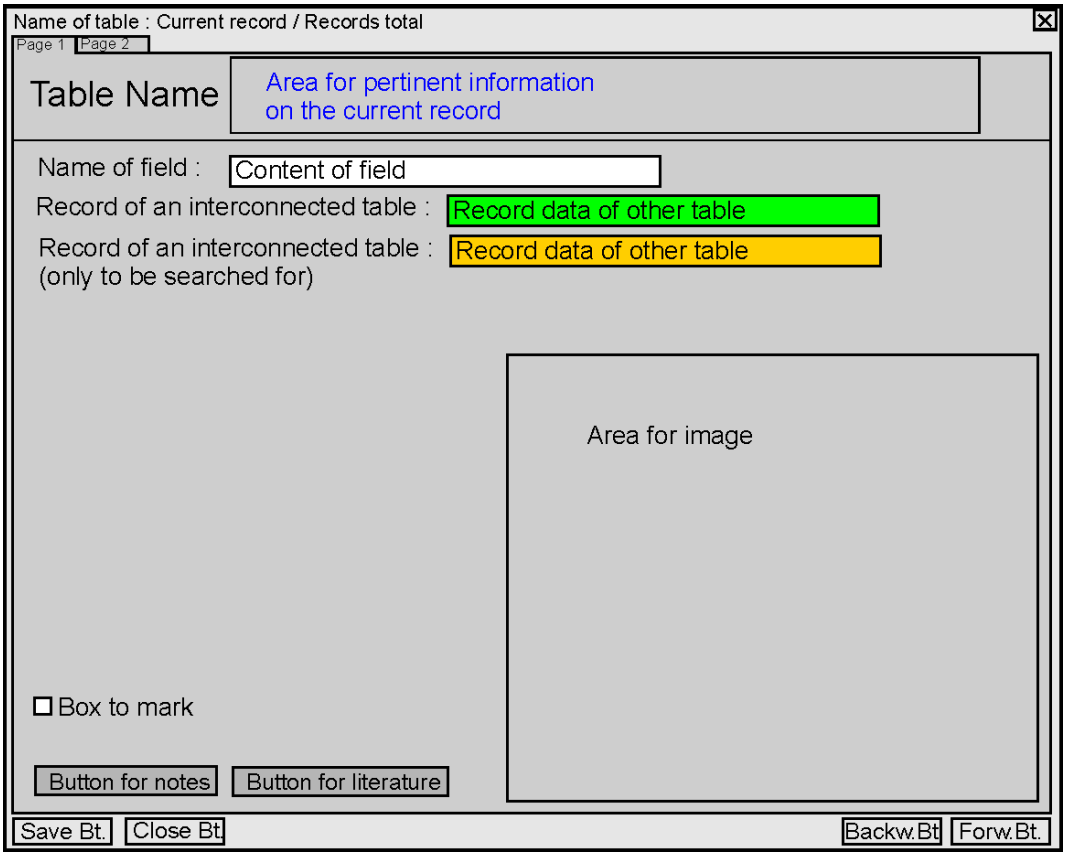


Figure 2.2. Principal design of the data acquisition forms.

In the top left of the form, the page can be selected (if there are more than one). In the top area of the first page stands the name of the table ("Specimens") and a box that may contain information on the current record (not in all tables). The main area shows the data fields. Data are in white boxes, data of interconnected tables are in green or orange boxes. In white boxes data can be written; in green or orange boxes data cannot be written. In green boxes, data can only be selected from a related table, or a new record can be appended to this table. In orange boxes, no data can be recorded or modified, but searched for. There can be buttons to add a note, literature, or an image. In some tables there is an area for an image. In the bottom area there are buttons to save the current record, to close it, and to go to the next or previous record.

The data acquisition forms are designed for a screen size of 1024 x 1280 pixels. Of course, the forms should also work with other formats that can be selected in the options (Application library > Options > Display) or directly in the search form. If you feel that the height of the data fields is too low or too high, or the font size is too large or too small, you may modify this in Application library > Options > Display > Adapt fonts.

It is not recommended to modify the forms except when adding new fields. New data fields should be placed on a new personal page. For adding fields to a table, please use the function of the database (Application library > Options > Tools > Modify structure). You may also create new tables and incorporate them into your application.

3 Data recording

Data recording begins with the download and installation of the programme as described above.

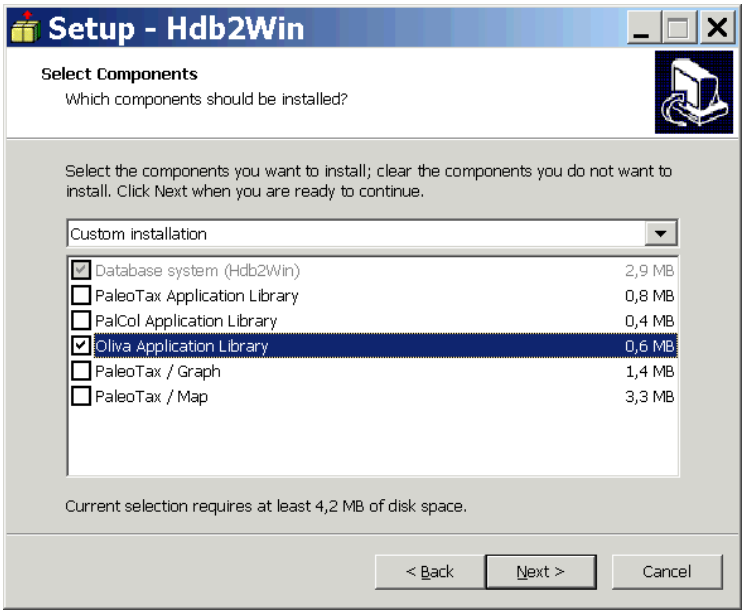


Figure 3.1. Mark the data structure you want to use.

When starting the database it may be that the programme terminates either with error code 13 or the programme looks blurred. Moreover it can be that it offers only very few different form sizes, even if your screen has a high resolution.

Again, on high definition or UHD screens it is necessary to set the properties of Hdb2Win correctly. Right-click on the symbol on the desktop, select Properties > Compatibility > Change high DPI settings.

Windows 10 : Mark the box '☒ Disable Display Scaling on High DPI Settings'.

Windows 11 : Here in the bottom box, mark the check box and select "Application".

After having done this, the windows of Hdb2Win are very tiny, moreover the text on buttons may be very small. First, most important forms can be make larger just by drawing. Second, you can increase the font size for all system buttons. To do so, choose 'Application library > Options > Adapt Fonts'.

3.1 Creating your database

When starting Hdb2Win in a freshly installed version and selecting Application library, only the installed data structures are shown.

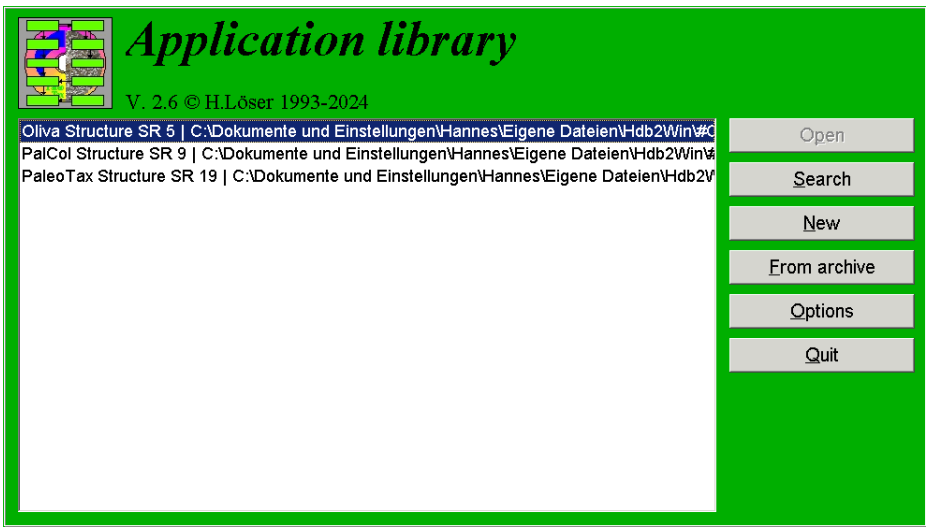
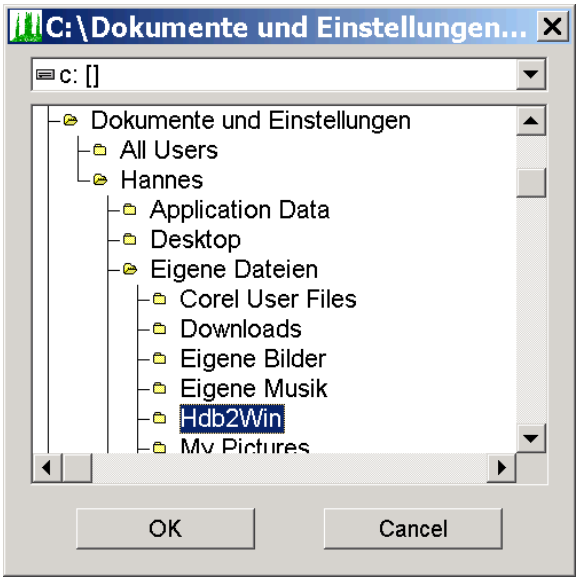


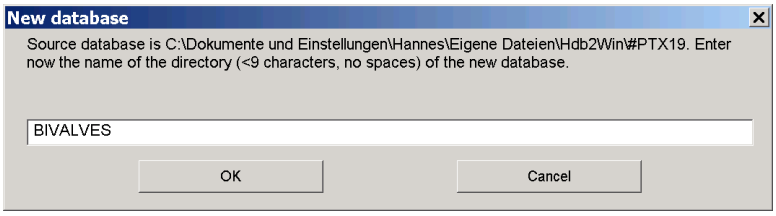
Figure 3.2. A freshly installed version shows only pre-installed data structures.

You cannot open this database (the button ‘Open’ is disabled). You have to create your own database by clicking on ‘New’. Follow the steps described below.

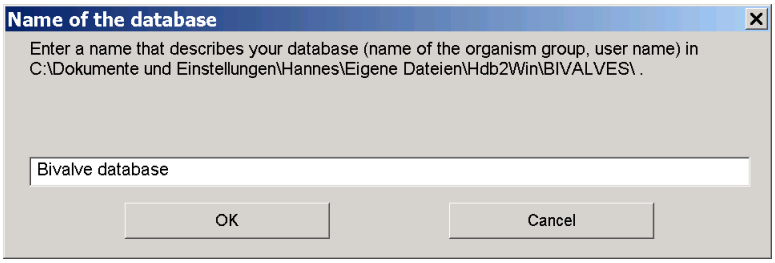
Select in a first step the directory where the new database should be installed.



This will be usually ‘c:\Users\<username>\Documents\Hdb2Win\’ (Windows from version 7 on) or ‘c:\Documents and settings\<username>\ Documents\Hdb2Win\’ (Windows XP).



Enter now the name of the directory. This is the short name, not longer than eight characters.



Enter now a longer name for your database.

Now you can see that the newly created database is in the list of databases and it can be opened.

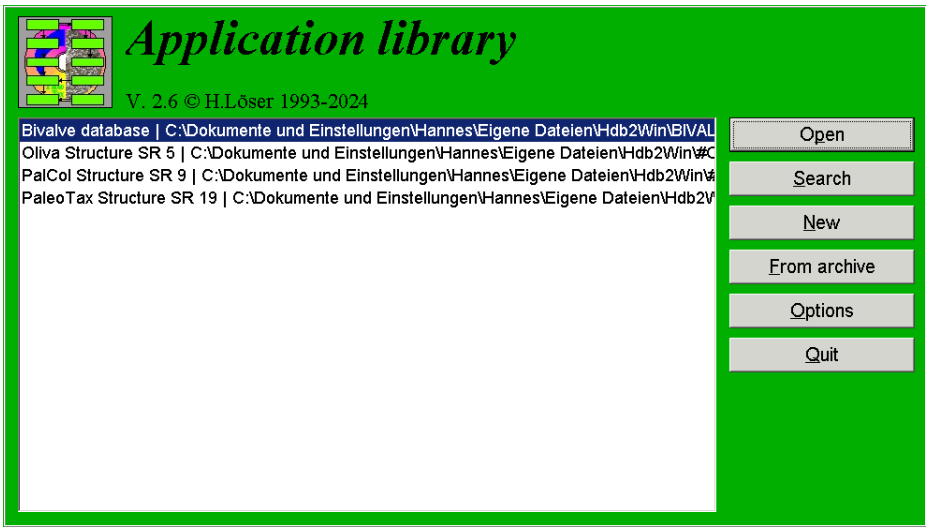


Figure 3.3. Database ready to be opened.

Keep in mind that in the Structure folders, there is always a fresh and unaltered version of the data structure is conserved. In the case you modify forms or programmes, you have always a original copy of the concerned file in this directory.

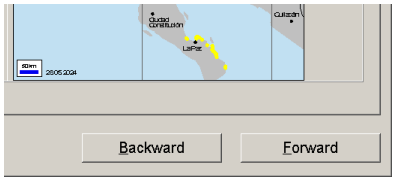
It is recommendable to create subfolders for documents (such as PDF files), images, and maps. **Do not modify** the name of the data folder and subfolder, otherwise this will cause a loss of the links from records to images, references, and documents. Hdb2Win does not store external data in its tables; it records only links to files.

3.2 Before recording

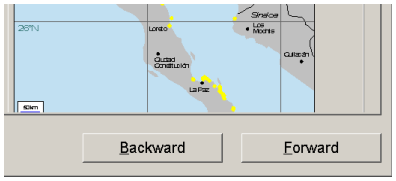
Before starting, it is useful to think about the following topics:

- Select the language after starting the programme by clicking on one of the flags.
- Define a date type in Application library > Options > Display. Later modification may cause problems.
- Select a font you like in Application library > Options > Adapt Fonts. The font set per default (MS Sans Serif) is not able to show special characters that are used in some lists, but is always available. A more handy font is for instance Arial or Times New Roman.
- Change the form size. If only few options are offered in the list (screen formats that cannot be selected are in brackets) but your screen has a high resolution you probably have to modify the properties of Hdb2Win as described above.
- After having decided for one form size, it can be possible that you have to adapt the font size for data fields, labels, list etc. So start again Application library > Options > Adapt Fonts
- In large data acquisition forms it can be that there remain space on the bottom of the forms or the elements on the bottom exceed the available area. This problem is related to different ratio aspects of different screens. You

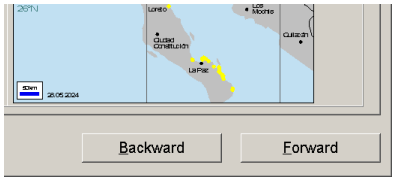
can correct this problem going to Hdb2Win > Application Library > Options > Display > Correction height of forms (%). See the example below:



There is much free space on the bottom > increase value.



Some elements are not shown completely > decrease value.



All fits well > do not change the value.

3.3 Importing data

It is generally possible to import pre-existing data into the database because the it can also append data from text files. For the application Oliva, there exist programmes that help with the import of data. For other applications the import of taxa, geographic or stratigraphic data e.g. tables that are not interconnected with many other tables, can be realised without any programming.

3.4 Recording

Data recording is very easy and self-explanatory. Usually, you will start recording data with the principal table (this is the table that is always the current table when openening the database). From this table you may record data in all tables that are connected to the principal table. It is not necessary to change from one table to another to append records.

Be aware that the number of data fields is an optimum choice. It is not a maximum nor is it a minimum. You are not obliged to fill in all fields (the systematic description of the tables in separate manuals gives you some orientation). Try to understand the data structure and the various tables and then make your decision. It is easier to start with less fields. The general experience is that the data recording does not require much time, but data verification and completion do require much time. You probably spend two hours in finding the correct position of a locality, but only one minute to record the locality in the database.

In the data acquisition forms various functions exist that may help to increase the speed of recording the data, for instance,

+	The plus key on the numerical keyboard (far to the right of your keyboard) or the combination ALT+Y (see Hdb2Win > Application library > Options > Display > Alternative '+' key) will fill in the same data as in the record edited or appended before (for the current field).
ALT+C	Copies the complete record from the previous edited or appended record.
INS	The Insert key (or Ctrl N, or double click) opens the record behind a (light green or orange) field that is interconnected with a record of another table. INS (or Ctrl-N) in an empty subordinated field creates a new record in the subordinated table.
F1	Shows a help line in the form.
F2	Opens a table of special characters to be inserted.
F3	Allows a text search in the current field through the whole table. Type at least five letters and all records are shown where this text was found in the current field. Select one.
F7	Fills some data fields with a default or calculated value (see description of the forms).
ESC	Leaves the record without saving.
F12	Saves the current record.
PgDn, PgUp	Saves and goes to the next / previous record. PgDn saves and closes the record of an interconnected table.

3.5 Interconnected tables

Since the structure of the database is not flat but rather is pseudo-relational, tables are interconnected in various ways. The most common is the connection between a table to subordinated tables. For instance, the table SPECIMENS has as subordinated tables the table SPECIES and the table LOCALITIES. If assigning a species a specimen, the species is chosen from the subordinated table SPECIES.

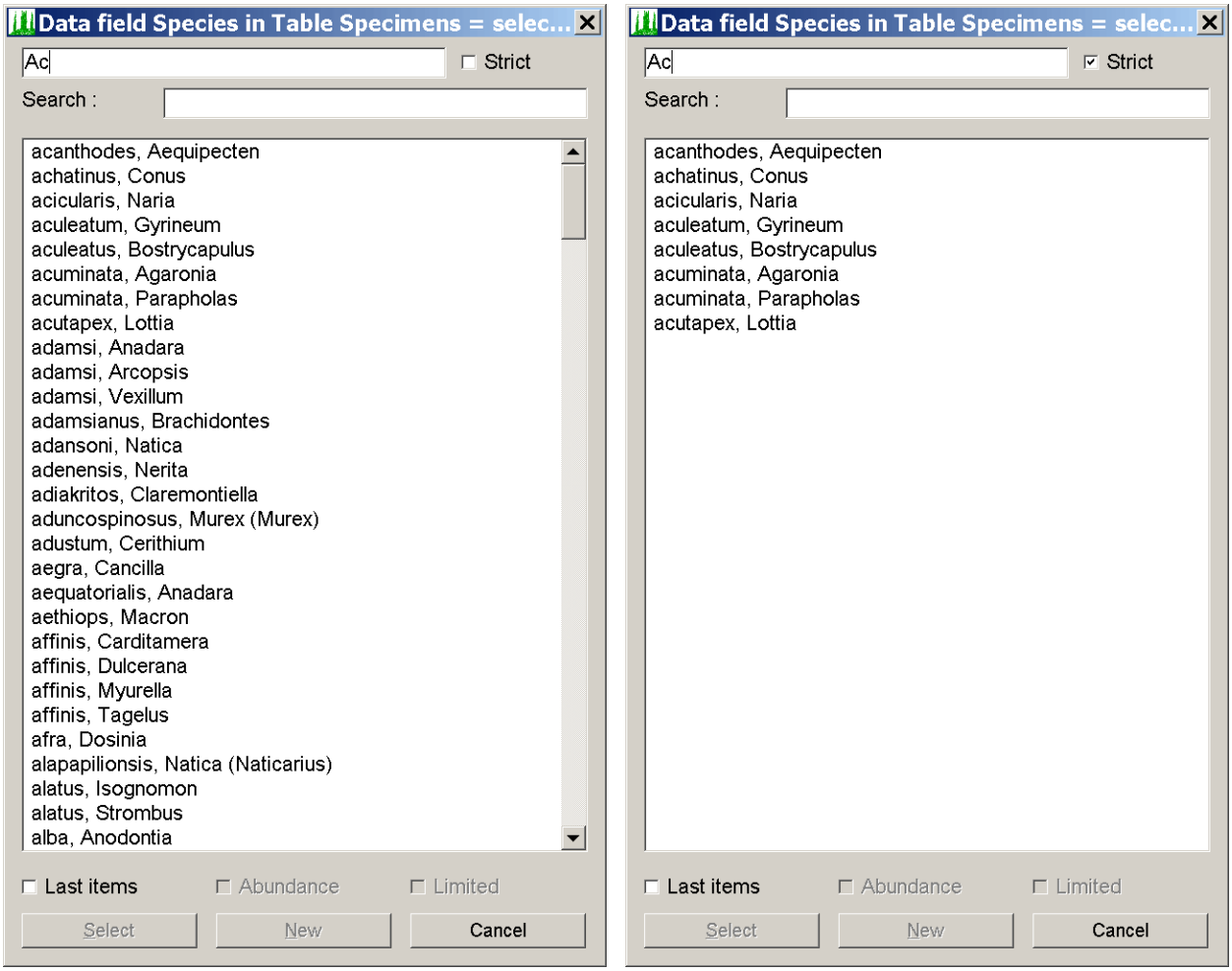


Figure 3.4. Selecting a species. Note that there is a check box labeled 'Strict'. If this box is checked, only items are shown that coincides with the entered letters, otherwise also items that are larger are shown. Left, not strict; right, strict.

In the lower part of the list to select from are three boxes. When ‘Last items’ is activated, a separate short list shows only those items that have been recently selected.

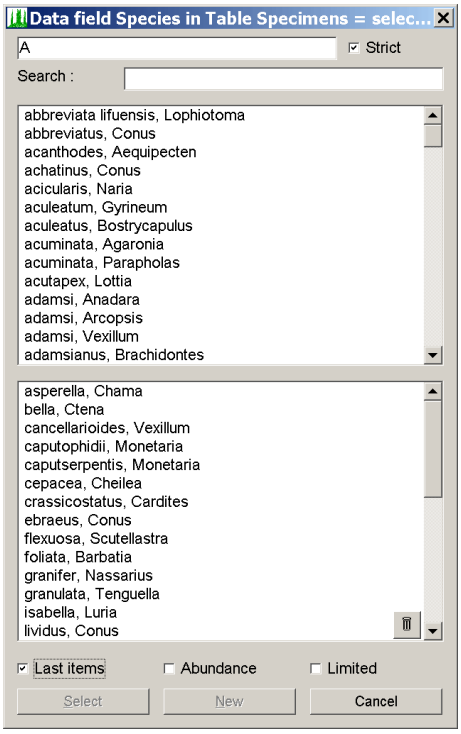


Figure 3.5. Selecting a species with ‘last items’ activated.

The amount of items can be controlled under Application library > Options > Tools > Extended Options > Select > ‘[94] Number of records to be included ... ’ and ‘[95] Number of records in the short list... ’. The box ‘Abundance’ sorts the items in the short list according to the abundance in the last records, and the box ‘Limited’ forces the system to show only items larger than the first entered letter. The option of the shortlist can be very helpful when working with a group of localities within a larger pool of localities or sample points.

Note that there is also a small bucket symbol. When klicking on this symbol, the hotlist will be discarded. This make sense when you are recording material from a certain area with a repeating set of localities, but then switching to another area with different sites. When you delete the hotlist, a new list will be created step by step but not including the former data.

The hotlist can be also suppressed for one table. Do to so, follow these instructions:

1. Start the programme, choose Interpreter.
2. Select Load and give as search mask *.DB2.
3. Select the table.
4. Go to the very end, still below the line '; --- END OF STANDARD'.
5. Add in one single line SHRTLIST OFF .
6. Save the file.

4 Search and output

The search mask (having selected a table and then clicking on search, or just double click on the table) opens the search and output form. Records must exist in the table, otherwise the function is disabled.

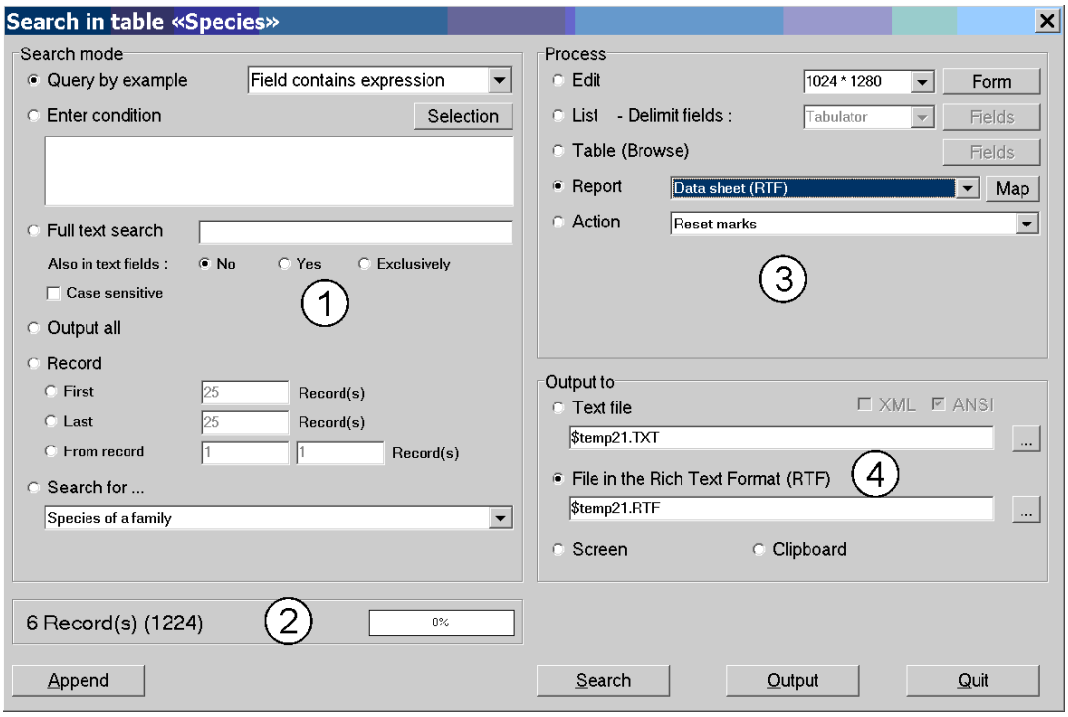


Figure 4.1. Search form for all tables. The size can be modified.

The search and output form divides into four sections.

1 Search area. You may select among various ways to search for records in the current table. The easiest is Query by Example. Fill in the form, for instance, with a genus name and all species with this genus will be shown. For the Query by Example search mode, there various options: in the Standard mode the fields must have exactly the same content. A search in the SPECIES table for *albus* in the species name field deliver only *albus*. The Wildcard mode (*) finds items that starts with the same letters. So, *alb** finds *albus* and *albicilla*. The Field contains expression mode finds any text contained in the field. A search for *alb* delivers *albus* and *balboae*. There is a full text search, a search for a specific group of records and in some tables there are predefined search options.

2 The number of total / found records.

3 The output area defines the way to output found records. Edit refers to the data acquisition forms, List writes to the screen, the clip board or a text file, Table shows the data in a table (press Enter within the table shows the record in the edit form), Report may be a specific format (HTM, RTF). Map shows a distribution map (PaleoTax/Map must be installed).

4 The target area defines (when Report is selected before) where the data are written to and in which format. For some programmes the output format is pre-defined. As for instance the data sheet of a species will be always in the RTF format, even if you select a different format.

For the output of data other options exist; some tables offer the output in the RTF format (e.g. specimen labels, lists). This depends on the application. The formatting is done with style sheets that you may change within the text processor or with the in-built style sheet editor (Application library > Options > Tools > Edit Style Sheets). Some output options export to the PaleoTax/Graph format (extension PGR). See in the manuals for the applications for more explanation.

5 Options and reorganisation

5.1 Options

The database programme offers a wide range of settings and options. General options that are valid for the work with the programme in general terms are found in Hdb2Win > Application library > Options, and more specifically in Hdb2Win > Application library > Options > Tools > Extended Options. There exists a detailed manual about the settings. Options valid for the current database are explained below in chapter ‘Options of the database’.

5.2 Hdb2Win Registry

Hdb2Win has a registry, a table that keeps various settings. In some applications, many programmes uses the registry to store specific programme settings. When called again, the programmes offer these settings as default values. The registry distinguishes between different users on the same computer, and databases kept in different directories. This is another reason why you should not modify the name of the data directory.

5.3 Reorganisation

Reorganisation is important for rapid and smooth data transactions. Within the main menu of your database is a button ‘Reorganisation’ that offers various options. Please start the reorganisation regularly, and select the first four enabled options as shown below.

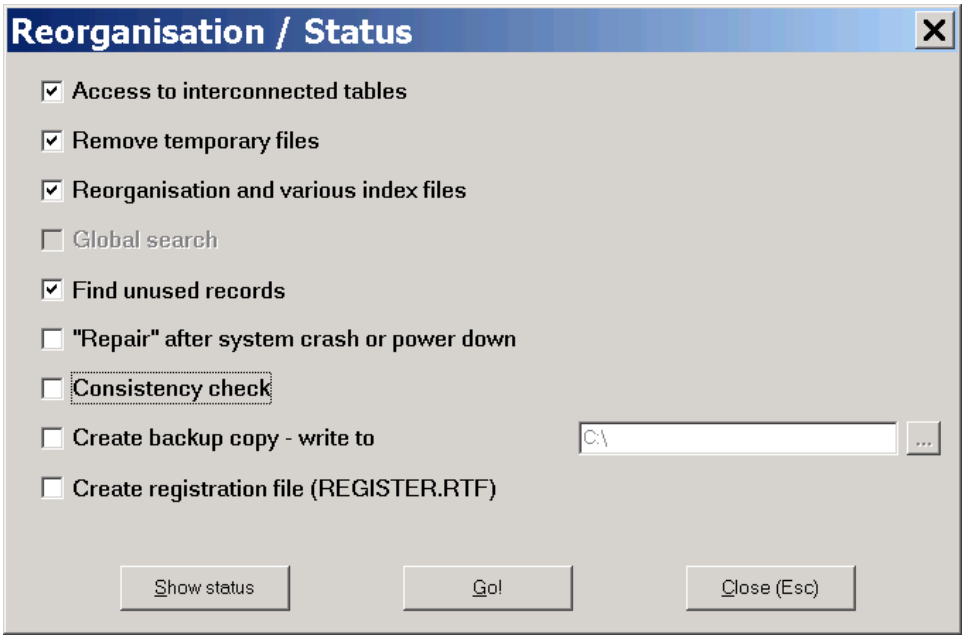


Figure 5.1. Reorganisation within the data base.

Access to interconnected tables – This action creates the index files which you need for access to interconnected tables. It is useful from time to time (as it speeds up selection).

Remove temporary files – It removes all index files for catalogues, list boxes and access to interconnected tables as well as all temporary text files. Temporary files are files beginning with ‘$’ or ‘~’ or having the extension ASC, BAK, FIX, SFX or SIK or whose extension starts with ‘~’. Index files are, of course, newly created after their deletion.

Reorganisation and various index files – The programme updates fields in red with the current data (tables GENERA, LOCALITIES, MARINE AREAS, SPECIES, SPECIMENS) and updates all orange fields. It also gives a short report about how many genera, species and specimens are recorded in the database. The programme also resets the assignation of images of sub-numbers to specimens. It assigns a specific collector to the sub-numbers, if this was

selected in the options. It makes only sense to run this programme when a certain amount of data is recorded (as for instance more than 50 records in the SPECIMEN table).

Global search – This option is not activated in all applications. It creates a file that allows to search through the entire database.

Find unused records – This task isolates unused records from interconnected files. Imagine that you have (for example) erroneously entered a genus twice and wish to remove this double entry. First mark the double entry (for instance with '~' in the name). Then search the Species table (which is interconnected to Genera) for this genus and replace it with the correct entry. In the subsequent task of finding unused records, this genus name should be marked with an asterisk (*), which indicates that it is not used any more by any species. You may overwrite this genus with another genus name.

"Repair" after system crash or power down – If you had a system crash or power down during work with the database programme, the data could be damaged. To find this out, check the database consistency immediately afterwards. Start the programme again, choose this task (no other!) and click on 'Go!'. If the programme is executed without errors, mark the first four tasks and start reorganisation again. If you have problems opening your database, start the Interpreter, open (Load) the programme entitled 'To be used if the database fails to open' from your data directory and start it (Run). After opening the database, mark the first four tasks and start reorganisation.

Consistency check – The programme checks the database for double records (same species and same locality), records with a number but without specimens, and records with specimens but without number. At the end of the routine, a brief report list shown.

Create backup copy - write to – Backup copies are useful when your hard disk breaks, when your PC has been stolen or you want to transfer data from one computer to another (or send them via the Internet to another user). The programme archives all files, including temporary and index files. It is therefore advisable to mark also 'Remove temporary files'. Only the data (not the programme) and only the currently opened database are copied. Backup copies can be stored in any directory or drive you choose. The data format is an internal format. The name is derived from the directory name of the database, the date and a serial number. Backup copies can be easily restored from the menu of the application library (before opening a database). The programme does not include files in sub directories, such as images, plots, or documents.

Create registration file (REGISTER.RTF) – You are not required any more to register.

6 The Rich Text Format

6.1 Introduction

All preformatted text output of the database are in the Rich Text Format (RTF). This text format produces small files, can hardly bear any viruses, and can be easily imported in many applications. In text processors exist two different way of formatting: direct and indirect. Direct formatting means that a paragraph or character format is directly assigned to a portion of text, as for instance by clicking on a format symbol in the tool bars at the top of the application. Indirect formatting means that for a specific paragraph or character a template is created. The formatting is assigned to the template. And the template is assigned to paragraphs or characters in the text. Any larger documents contains different types of paragraphs, such as the main text, smaller text with indention, images, caption of images etc. When for each of these paragraph types a template is created, the formatting of this type of paragraph can be modified globally by modifying the template, but not the text itself. Templates can be also assigned to character formatting.

RTF files created by Hdb2Win are always indirectly formatted. When you create a set of specimen labels and you wish to modify the format of some parts, there are two options. You may modify the template within the text processor or you modify the template that is applied by the database. As already mentioned above, in RTF files it is not possible to define the size of the bitmap images. Vector graphics are mostly shown in the original size. Note that there is a manual that describes in detail how to edit the style sheets (https://www.paleotax.de/TCV-22.pdf).

6.2 Edit Style sheets

The templates for one specific purpose (labels, the data sheet etc.) are gathered in three ASCII files with the extensions FCH, FDN, and TCV. You may create and modify style sheets. This function is located in Hdb2Win > Application library > Options > Tools > Edit Style Sheets.

Read a file (Load) or starting with a new file. In a new file two formats are always predefined and cannot be modified or deleted. These are the standard formats. Create a new format by clicking on ‘New’. Select a format type and enter the name. To modify a template, select a format from the ‘Select format’ list. The templates for paragraphs and characters differs. Whereas characters only encompasses the formatting of characters such as bold, italics or underline, in the paragraph template encompasses the formatting of the paragraph and the characters. If the character format is not defined within a paragraph template, the character formatting follows the standard character formatting.

Before modifying existing style sheets, you better create a copy of the FDN file (as for instance OLIDS_ori.FDN). You need only to backup the FDN file because the FCH and TCV files are created when saving a FDN file. The FDN file contains the style sheet data whereas both the TCV and FCH files are needed to create the RTF file.

7 Structural modifications

As with other structural designs, there will be regular updates. These updates (*Service Releases*) improve forms and programmes that are provided with the structure. Sometimes, data fields or tables are added to meet user demands. By default, the structure is on SR5, but later updates can bring it to SR6 and others. A new *Service Release* comes together with a new programme version. It consists of a new data structure and a path with the update programme for existing databases. After installation of the package, the SR can easily be applied to an existing database and bring this database to the current level.

Former versions of updated or modified files are saved in a path created by the Service Release programme. It is, therefore, possible to return to the previous service level, when something goes wrong. If, meanwhile, you have modified data acquisition forms or the data structure, your changes will be conserved. In the case where you want to modify programmes, it is better to work with a personal copy. Let us assume that you want to modify the HTML output. You should, therefore, create a local copy of the file oli_html.prf and rename it to (for example) oli_html_new.prf. Modifications should be made in this file. The Service Release will never touch files that are not part of the standard.

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