Linnaeus II

USER GUIDE WINDOWS VERSION 2.5

Hawksbill Turtle – *Eretmochelys imbricata* (Linnaeus, 1766)

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Preface

The Linnaeus II software tools were developed to provide taxonomists, ecologists and biodiversity specialists with a content management system that allows them to store, manage, exchange, combine and electronically publish scientific information in a standardized format. The Linnaeus II software has been developed by the ETI Biodiversity Center, an NGO in operational relation with UNESCO. Its mission is to develop innovative computer-based systems to concentrate, preserve and distribute taxonomic and biodiversity knowledge and to act as a specialized informatics center to technically support the life sciences.

The Linnaeus II software comes in three different modules:

- Linnaeus II Builder (the content management system that allows you to create information systems)
- Linnaeus II Runtime (to disseminate completed information systems as electronic publication on CD-ROM or DVD-ROM)
- Linnaeus II Web Publisher (a Web-based version to disseminate information systems via the Internet)

Information on the Linnaeus II tools as well as other software applications and services for the scientific community by ETI is available on our website: www.eti.uva.nl. An overview of CD-ROM publications made with the Linnaeus II software is available at: www.etiis.org.

This manual explains the use of Linnaeus II Builder version 2.5. It allows you to create your own taxonomic or biodiversity information system. With this software you can store and manage multimedia information on taxa in your field of expertise, including text descriptions, photographs, drawings, audio, and video. It also allows you to create various types of computer-aided identification keys and to set up an interactive geographic information system with distribution data. The thus formed Linnaeus II information systems can be published as electronic monographs on compact disk or made accessible via the web. They are Species Banks in the true sense as intended by the Global Biodiversity Information Facility. Data stored in the Linnaeus II format can be easily exchanged and merged with information from fellow scientists.

ETI provides the academic license free of charge to scientists who wish to participate in the ETI Partner Program and intend to contribute taxonomic and biodiversity data to the ETI/UNESCO 'World Biodiversity Database'. Completed data sets are, after peer-review by specialists, electronically published and thus made available to all scientists and other interested parties. We invite taxonomists and biodiversity specialists to enter data on their field of expertise and to contribute to the completion of the World Biodiversity Database.

If you have any comments on the program or this manual, please contact ETI at:

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ETI's Partner Program

The ETI Partner Program was set up by ETI and UNESCO. Its purpose is to make a contribution to the documentation of the world's biodiversity by working with the scientific community to build a 'World Biodiversity Database' that describes, depicts and identifies the presently known 1.7 million species. ETI Partners are scientists with expertise on a particular group of organisms. Partners state their intention to contribute data on their taxon or region. A Partner receives a free copy and user license of the Linnaeus II Builder software package allowing for the use of this software on their own computer equipment.

A Partner maintains his/her Linnaeus II information and identification system as a multimedia record of that taxonomic group. Scientists who do not have access to multimedia input devices (such as scanners, sound recorders, and video boards), may work at ETI's multimedia lab (bench fees apply) or hire ETI staff (against nominal fees) to digitize photographs, sound recordings and video tapes in a computer format that can be used in the Linnaeus software. ETI staff can also build a whole information system as assignment. Partner Networks, associations between Partners who work together on the same taxon or region, may be formed.

Completed information systems and other submitted data to the World Biodiversity Database are subjected to a peer-review procedure before being published on CD-ROM/DVD-ROM or the Internet, so that a high quality of information can be maintained. ETI sponsors the publication of completed Linnaeus II monographs on CD-ROM. Available funding limits the number of such 'e-publications' to 10 CD-ROM titles per year. The idea of releasing your data on CD-ROM may be new to you. We urge you to keep in mind that publication on CD-ROM can be thought of in exactly the same way as publication in printed form. All ETI CD-ROMs have ISB numbers and are sent to major organisations referencing scientific publications (e.g. *Zoological Records, Current Contents*). ETI does not claim copyrights as it promotes the sharing of information. The authors and contributors remain owner of their information and merely transfer the non-exclusive right of electronic dissemination to ETI. Partners receive a copy of their CD-ROM free of charge in return for their contribution.

Software and hardware requirements

The Windows version of Linnaeus II version 2.5 requires a PC running Windows 98, ME or XP, with at least 32 Mb free RAM memory. We also urge you to use a monitor that can display 32-bit images ("True color" / "Highest" setting), so that high-resolution images are correctly displayed.

You should also consider how much storage space you will need. You may need significant amounts of hard disk space – multimedia materials (images, audio and video) take up particularly large amounts of storage space.

How to install and run the software

To install Linnaeus II 2.5 on your computer's hard disk, double-click the "Setup.exe" icon. This will launch the installation program.

Important: Under Windows XP, Linnaeus II can be installed in the Programs folder only if you have full administrative privileges. Users with a Limited User or Guest account will be able to install the program in the Programs folder if they have access to an administrator password.

How to start the program

1. Click on the Start button in the task bar (usually located near the bottom of the screen).
2. Select Programs from the list now shown.
3. Select ETI from the subsequent list now shown.
4. Select 'Linnaeus II 2.5' and click once on this item.

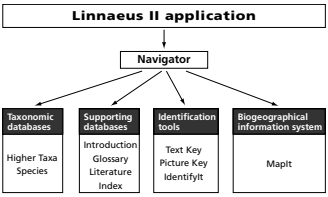
How to delete the program

1. Click on the Start button in the task bar (usually located near the bottom of the screen).
2. Select Programs from the list now shown.
3. Select ETI from the subsequent list now shown.
4. Select 'Uninstall Linnaeus II 2.5' and click once on this item.

Introduction

The Linnaeus II software package consists of a number of parts, known as "modules." These modules can be divided into four categories:

- the taxonomic databases
- the supporting databases
- the identification tools
- the biogeographical information system



The software package consists of the Linnaeus II application, the Navigator and ten additional modules.

The taxonomic databases consist of two modules: Species and Higher Taxa. The Species module is usually the most important part of your database. It holds text and multimedia information on species (as well as subspecies and other taxa below species level) within your taxonomic group: descriptions, synonyms, common (vernacular) names, taxonomic information, literature references, photographs, drawings, audio, video, etc. The Higher Taxa module can be used to store information on all taxa above species level.

The supporting databases can be used to store additional information.The Navigator acts as the central point or "main menu" of your project; it can be used to navigate around Linnaeus II and store information on scientists, students, publishers, and other contributors to your project. Use the Introduction to enter general and introductory material on your taxonomic group; you can also store other information here on topics such as methodology. The Glossary holds definitions for technical terms used in the program. The Literature module contains literature references for your group. And the Index lists all described species and other taxa in alphabetical order, as well as (sub)species epithets, scientific synonyms and common (vernacular) names given for the described taxa.

There are three identification modules which let users of the program identify a specimen based on its characters. The identification tool which will probably be most familiar to you is the Text Key™, because it simply is an electronic version of written dichotomous keys. The Picture Key™ is similar to the Text Key but is picture- rather than text-based, and therefore better suited to visual identification.

The third, most powerful identification tool is called IdentifyIt™. It is a multiple-entry key based on a matrix of taxa, characters, and character states. Unlike the Species and Higher Taxa databases, which hold text descriptions of the taxa, in IdentifyIt taxa are described in a more structured format: as a series of character states. This allows you to easily obtain answers to specific questions like, "Which species are red and/or white with wings and large feet?" We therefore encourage you to enter as much information as possible in the IdentifyIt format because this will allow you to get the most out of your data.

IdentifyIt has been designed to allow multiple data files for each group. Thus, you could create one IdentifyIt file for basic taxonomic descriptions, one for ecological characteristics, and one for morphologic or structural information. Or it could be useful to create one IdentifyIt file for characters as seen in preserved specimens, and another for fresh specimens. You can also create a "master" or metafile leading to specific files for each larger taxon within your taxonomic group.

Linnaeus also contains a biogeographical information system called MapIt™. This grid-based system allows you to enter geographical data on species and other taxa, such as distributions and type localities. The data can then be used to, among other things, search for species occurring in a particular geographic region, compare the distribution of a species to that of another, or display species richness.

How to get help

This manual is included with Linnaeus II version 2.5 as a PDF (Portable Document Format) file. You can access it using Acrobat® Reader, which is included on the Linnaeus II version 2.5 CD-ROM version. You can also download the program free of charge at http://www. adobe.com/acrobat/

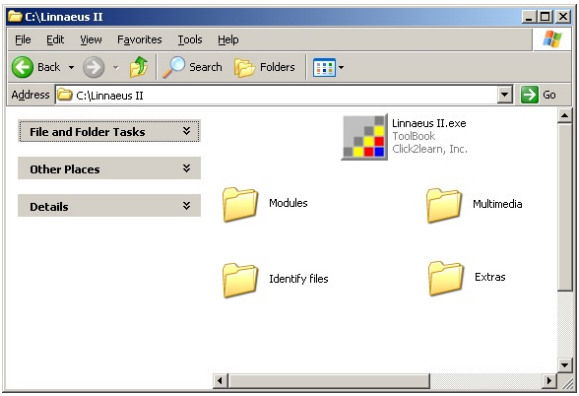
The Linnaeus II manual is also available within the program by going to the Help menu and choosing the section that you want to read. This will open the Help window to the appropriate page. You can also click the Help button in the Navigator to open the Help window. The online documentation is fully searchable: click on the Find button in the Help window, then enter the text string that you want to find, and click on Find or press return.

Before you start

We urge you to first take some time to learn your way around Linnaeus II. That way, you will feel more confident when you begin using the software to enter actual data, and you will reduce the chance of making mistakes and having to re-enter your data. If you have been working with an older version of Linnaeus II (versions 2.0 up to 2.2), please take some time to familiarize yourself with the changes in interface and functionality by checking out the section "What's new in version 2.5."

There are also some important things you should consider and understand before you start entering your data.

The Linnaeus II folder. All the files associated with your project should be placed within a single Linnaeus II folder, in the appropriate subfolders within this main folder. You should make a backup copy of your modules at least once a day, and a backup of your entire Linnaeus II at least once a week. However, it's important that you do not keep two copies of the Linnaeus II application on the same volume, or work with more than one copy, because this may cause Linnaeus II to get confused and crash your computer.



The main Linnaeus II folder contains the application and four folders.

Multimedia files should be placed in the Pictures, Sounds, Movies, and Text subfolders of the Multimedia folder. You can better organize your multimedia files by creating new subfolders within the Multimedia folders, e.g., an Overview Pictures folder within the Picture folder. However, you must tell Linnaeus about the existence of any new folders. To do this, choose Edit Paths... from the File menu, click on Add..., and choose a file within the newly-created subfolder. For more information, read the section on "Customizing your project."

Be consistent when entering your data. For instance, if you use subheaders in the description of a species, then you should use the same subheaders

in all species descriptions. Do not mix fonts, sizes, and styles. Use 8-point Verdana for all text.

When you copy text from a Microsoft Word document and paste it into a text field in Linnaeus II, the text sometimes includes unwanted information about the font(s) used.

When in doubt, consult the manual or contact ETI's support staff.

What's new in version 2.5

This section outlines the most important changes in version 2.5 of ETI's Linnaeus II software package. If you have not used an older version of Linnaeus, you can skip this section.

Linnaeus II version 2.5 no longer has a Lower Taxa module; taxa below species level are now stored in the Species module. Taxa below species level now have a four-word name also indicating the subspecific rank, e.g., the subspecies "*Terrapene carolina mexicana*" becomes "*Terrapene carolina* subsp. *mexicana*".

The Taxonomy field in the Species and Higher Taxa modules is now called the Classification field. The available taxonomic levels have also changed - the highest available level is now domain (in previous versions, the highest level was kingdom), while the number of available taxonomic levels below species level has been reduced to five: subspecies, variety, subvariety, form and subform. You can now enter your own kingdom and phylum names, while in previous versions you were restricted to a preset list of names taken from Margulis & Schwartz' *Five Kingdoms*.

The Index now allows you to list the epithets of species and lower taxa names as well, e.g. "*exigua (Janthina)*" for the species *Janthina exigua*. If you choose to include synonyms in the Index, epithets of the synonyms will also be listed in the Index. In addition, the Index module is now better at handling duplicates – two or more taxa with the same synonym or common name.

In IdentifyIt, the Identify menu has been overhauled. File commands (e.g. "Open Identify File", "Save Identify File") have been moved to the File menu, while the commands Search Unknowns, Add Unknowns and Remove Unknowns have been replaced by a single command, Include Unknowns, which can be toggled on and off to indicate whether you want to take unknown (undefined) characters into account when calculating the match percentages. Another important interface change is the Add... button under the Identify tab, which has been renamed Define... and opens a window called Define Search Pattern.

The Find/Replace function now allows you to limit your search to one or

more fields in a module, e.g. you can search the name field only, ignoring the other fields. To access this feature, click the Fields... button in the Find window (or the Replace window).

The Run Demo feature (accessible from the File menu) now allows you to skip the fields during the demo and only show the pictures linked in the Multimedia field of the Species and Higher Taxa modules.

Find Hotwords now supports literature reference links in the format "author (year)" as well. Verify Multimedia Files is a new command in the File menu that allows you to check whether all linked multimedia files can be found, verifying that none of the files have been accidentally renamed, deleted or moved to a location where Linnaeus II can't find them. Port Multimedia Files lets you generate a folder with cross-platform multimedia and identify files (i.e., files with names that are valid in both Windows and Macintosh OS).

In the Picture Key, new text-only choices now get a standard size, so you can easily use the Picture Key as a text key (with the occasional picture-based choice) as well. Both the Picture Key and the Navigator now display a line grid when you hold down the Control key to help you place and align key choices and module buttons.

Using Linnaeus II

This section explains the basic functionality of Linnaeus II. It will tell you how to navigate around the software package, search for text, and export or print text. Data entry is discussed in later chapters.

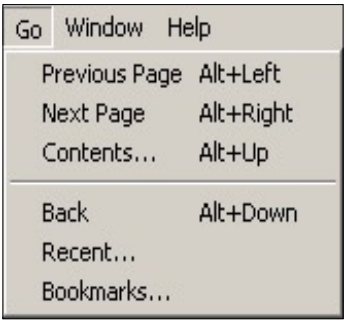
Windows. Each "module" (a Linnaeus II file) is shown in a separate window. These windows can be opened by clicking on the icons in the Navigator or choosing its name from the Window menu; a check mark in this menu indicates the module window that you are currently using. The menu also provides some commands that are useful for people with small screens. The Close Window command provides you with a handy keyboard shortcut (Ctrl+W) to close the topmost window. The Close Others command (Ctrl+Shift+W) closes all windows except the topmost one.

In addition to the module windows, the Window menu also lists any windows that are currently open, including multimedia and notepad (text editing) windows.

Navigation. Each module consists of a number of "pages" that you can leaf through just like in a real book. To turn to the next or previous page in a module, click on the Next and Previous buttons along the bottom of the window. You can also select Next Page or Previous Page from the Go menu,

or use the left and right arrow keys on your keyboard (whenever the cursor is not inserted into text).

To see a list of all pages in the module that you are currently using, select Contents... from the Go menu. You can also click on the Contents button in the current module window, or press the up arrow key. Scroll down the list to find the page you want, then click on Go or press return to jump to that page.



Use the Go menu to turn to another page or retrace your steps.

To retrace your steps through Linnaeus II, choose Back (Ctrl+K) from the Go menu or click on the Back button in the current module window. This takes you back to the last page visited (rather than the last window, as it did in older versions of Linnaeus II). You can also choose Recent... from the Go menu to see a history, or list of all the pages that you have visited since you launched Linnaeus II, and then return to any of these pages. You can see the list of pages alphabetically or in the order that you visited them.

Finally, Linnaeus II offers a bookmarks feature similar to the ones found in Web browsers. This feature allows you to create free-form subsets of your data, and is therefore useful not only to CD-ROM users, but also to scientists entering data. To place or open bookmarks, you must first create a new bookmarks file or open an existing one. To do so, select Bookmarks... from the Go menu, click on New... or Open... to create or choose a file, and then click on OK in the Bookmarks dialog box. A Bookmarks menu will now appear in the menu bar. From this menu, you can select Add Bookmark to bookmark the current page, or jump to any bookmarked page.

Fields. Each database module consists of a number of text fields. To switch between fields, click on the "tabs" along the top of the window. When the field name shown on the tab is "grayed out," the field is empty on that page. To edit the text in the fields, you have to "unlock" them by clicking on the lock icon. Click again on this icon to lock the fields. The fields are also automatically locked when the window is closed.

There are some exceptions. Classification and Multimedia fields cannot be edited directly. When the fields are unlocked, click in the Classification field to open the Edit Classification dialog box, and click in the Multimedia field to open the Edit Multimedia dialog box. You can also choose Edit Classification... (Ctrl+J) or Edit Multimedia... (Ctrl+E) from the Entry menu. In the Literature module, the Key Words field cannot be edited directly; select Edit Key Words (Ctrl+E) from the Entry menu to edit this field. In the Navigator, the "About ETI" field cannot be edited except by ETI staff. In the Index module, the fields cannot be edited; to update the information in the fields, choose Update Index from the Entry menu.

Finding text. To find a text string or word(s), open the Find window by selecting Find... (Ctrl+F) from the Edit menu. Choose the window where you want to search from the dropdown menu marked "Search in:". You can also select "Search everywhere" from the dropdown menu to search system-wide. Enter the text that you want to find and click on the Find Next button or press the Enter key. Linnaeus II will then perform the search and highlight (invert) the found text. Click on Find Next to find the next occurrence of the text string. You can also click on Find Previous to jump back to the last hit that was found.

The Find window lets you find text in a module or anywhere within your project.

For your convenience, you can click on the black triangle to the right of the text box in the Find window and use the dropdown menu to select a text string that you have searched for once before since you launched Linnaeus II.

To find all occurrences of a text string, click on the Find All button. After searching, Linnaeus II will present the results in the Items Found window, which lists the window, page, field, and sentence where each hit was found. Now click on an item in the list to jump directly to that hit. You can also save or print the list of items found by clicking on one of the two icons in the top left corner of the Items Found window.

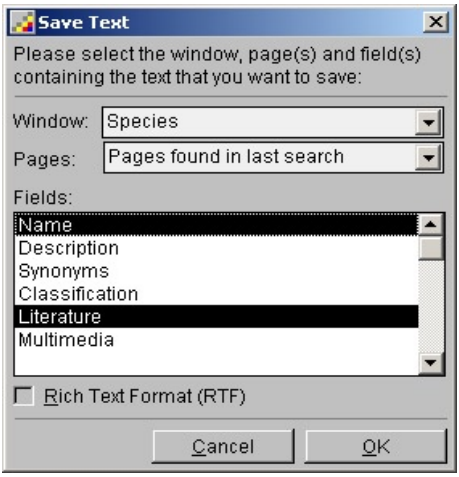
To perform a global search, choose "Search everywhere" from the dropdown menu in the Find window and then click on Find All.

To limit your search to one or more fields of a module (for example, to search the page names only), click on the Fields... button and select the fields

that you want to search from the list.

You can perform find-and-replace operations by selecting Replace... (Ctrl+G) from the Edit menu. Click on Find to find the occurrence of the text that you want to replace, then click on Replace to replace it with the text string that you have entered in the Replace window. Replace & Find replaces the currently selected hit and immediately searches for the next hit. To replace all occurrences in a window, find the first occurrence of the text string that you want to replace and then click on Replace All. Note that you cannot select "Search everywhere" from the window dropdown menu in the Replace window at this time.

Saving and printing text. You can export text in Linnaeus II to a file by using the Save Text... and Export Text... commands in the File menu. You can also print text by selecting Print Text... from the File menu. The Save Text... command lets you save text in standard format, while the Export Text command is available only to entry users (and not on the final published CD-ROM version) and lets you create custom exports that can be re-imported into Linnaeus II or another program, like a database or spreadsheet.



Choose Save Text... from the File menu to save text to a file

Use the top dropdown menu to choose the window from which you want to export text, and the second dropdown menu to select the range of pages from which you want to export text. Then click in the list to select the fields that you want to export. Check off the "Rich Text Format" box to export the text in RTF format, which retains the bold, italic, and underline text styles. If you selected Export Text... (rather than Save Text... or Print Text...), you must also specify the field delimiter, i.e., the character(s) placed between the text of each field. The best field delimiter to use is dependent on the program

where you want to re-import the data.

When you save or print a key, you can select the format in which you want to do so ("linear" or "hierarchical") from the dropdown menu marked "Format."

When you choose MapIt from the top dropdown menu, you can only select one field in the list. Check off "Include map data" to include information about each relevant grid square in the export.

Customizing your project

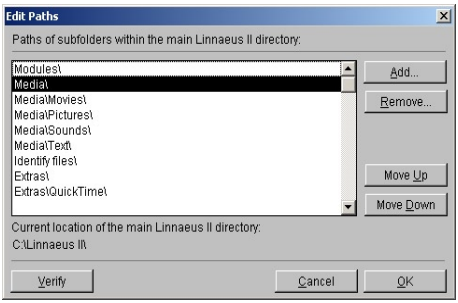
You can customize your project in a number of ways. Some things you should always do, while others are advanced features that should be used only in consultation with ETI.

Project title. To enter or change the title of your project, choose Edit Project Title... from the File menu. After you enter the title, it will appear at the top of the Navigator window. If you want, you can also change the name of the Linnaeus II application in Windows Explorer to the name of your project. Before doing this, however, you must first exit Linnaeus II.

Navigator. Use the Welcome and Contributors fields in the Navigator to enter, respectively, a welcome message and credits specific to your project.

Paths. You have to tell Linnaeus in which subfolders within the main Linnaeus II folder it should look for files. For instance, if you add an Overview Pictures folder within the Pictures folder, Linnaeus won't be able to find the files within this new folder until you tell it about the new folder. You can't add paths outside the main Linnaeus II folder (the folder where the Linnaeus II application resides).

Choose Edit Paths... from the File menu to bring up the Paths dialog box. Here, click on Add... to add another path to the list and on Remove to remove the paths that you have selected from the list. Click on Verify to verify that all the paths are still valid, i.e., that those subfolders still exist. When you are done, click on OK.



Choose Edit Paths... from the File menu to change the list of subfolders within the main Linnaeus II folder.

Linnaeus II will offer to add a path automatically whenever you select a file in a folder that it doesn't know about (when you click on Add... in an Edit Multimedia dialog box, for instance). The list of paths are stored in the "Linnaeus Prefs" file in the Extras folder.

Modules (advanced feature). Choose Edit Modules... from the File menu to bring up a dialog box where you can attach or remove modules from your project. For example, if you won't be using the Picture Key module, you can remove it from your project so that it will no longer be shown in the Navigator or in the Window menu. When you remove a module from your project, the module file is not deleted from the Modules folder, so you can re-attach it to your project at any time.

In the Edit Modules dialog box, click on Add... to add a module or on Remove... to remove the selected modules in the list. You can change the order in which the modules are shown in the Window menu by clicking on the Move Up and Move Down buttons. Click on Divider to add a divider (separator) to the Window menu, shown in the list as a "-".

Custom modules (advanced feature). The Edit Modules... command also lets you create a custom database module. In the Edit Modules dialog box, click on the New Module... button to open the New Module dialog box. You must now provide the name of the new module and the title of the page name field (e.g., "Method" for a methodology database), and choose between one of four database templates. The standard template is similar to the Higher Taxa module; the Species template adds an overview picture; the Introduction template provides a single-field database with an overview picture; and the Glossary template provides a small window with an A-Z bar like the Glossary and Literature have.

You must also provide the names of the text fields and the order in which they will be listed as tabs along the top of the window. Use the Add, Remove, Move Up, Move Down, and Rename buttons to specify the fields.

Click on OK to close the New Module dialog box, then click OK to close the Edit Modules dialog box. Linnaeus will now create your custom module (using the Module Templates file in the Extras folder), adding its name to the Window menu, and adding a button to the Navigator. You can move this button by holding down the Control key and dragging it to another location in the Navigator window.

Custom fields (advanced feature). Select the Edit Fields... commands to edit the text fields of the current module window. This command brings up the Edit Fields dialog box, where you can add one or more fields to the module; remove fields; rename fields; or change the order of the fields. You can customize the database modules, but not the identification modules (Text Key, Picture Key, IdentifyIt, MapIt). The maximum number of fields allowed

varies from module to module; the Navigator allows five fields, while the Introduction only allows one (not counting the page name field).

Be very careful: if you remove a field, you will also lose the text that it contained – on every page in the module.

Working with text

Each database module has a number of text "fields." Click on the lock icon to "unlock" the fields so that you can type in them.

The Edit menu contains all the commands that you need for text editing. Here you can cut, copy, and paste text; change the font, size, and style; find and replace text; and insert a hypertextual "hotword" that users can click on to open a multimedia file, or jump directly to a page in the same or another module.

Undo. The Undo (Ctrl+Z) command in the Edit menu undoes all changes that you've made to a text field since you've inserted the cursor into it. This function works only in the text fields of the database modules (Navigator, Introduction, Species, Glossary, Literature, and custom modules).

Changing the font, size, and style. For maximum legibility, text should be in 8-point Verdana. To change text to this font and size, select it and then choose "Verdana 8" from the Edit menu. Please consult ETI before using any font other than standard Windows system fonts.

The Style submenu lets you change text to boldface (Bold, or Ctrl+B), italics (Italic, or Ctrl+I), or underlined text (Underline, or Ctrl+U). You can also remove text styles by choosing Plain (Ctrl+T) from the Style submenu.

Inserting a page name or hotword. To insert a page name (such as a species name or literature reference) or a hotword that opens a multimedia file or takes the user directly to another page in the same or another module, use the commands in the Insert submenu of the Edit menu. To insert a link to a file into the text, choose Multimedia File... and then select the file you want from the file dialog box. Valid file types are: text files; TIFF and JPEG images; and QuickTime audio/video files. After you click OK, the file name is inserted into the text as a blue-colored "hotword." This means that, when the fields are locked and you click on the file name, the file will open automatically in a multimedia or notepad (text) window.

In the dialog box that opens when you choose Page Name..., you can select a window and then choose the page within that window that you want to insert into the text. You can also choose between "Normal Text" and "Hotword." If you click on "Hotword," the inserted page name will be colored

blue and become "hot" so that, when the fields are locked and you click on the page name, you jump directly to that page.

You do not need to insert any hotwords yourself. After your project is completed, ETI staff will generate the hotwords for you by running software that searches the texts for page names and turns them all into hotwords (clickable links to other pages in the same module or other modules).

Notepads. When you click on the name of a text file in a Multimedia field, the text file is opened in a "notepad" window. Here, you can save the text under another name, print it, or copy part of the text. You can also open any text file in a notepad window by selecting Open Notepad... from the File menu. If you want to jot down some notes, or simply need a separate text-editing window, choose New Notepad... from the File menu or click on the Notepad button in the Navigator.

Working with multimedia

Linnaeus II supports four types of multimedia files:

- text
- pictures
- audio
- video

When you open a text, picture, audio, or video file in Linnaeus II, its contents are shown in a multimedia window. Along the top of the window are icons that you can click to print the file, save a copy of the file, or (for pictures) zoom up and down.

Text files can be written with a Linnaeus notepad, which you can create by selecting New Notepad... from the File menu. You can also use a text editor, or a word processor such as Microsoft Word. Note that text files are plain text – fonts, sizes, and styles (bold, italic, and underlined text) are not shown.

Image files must be saved in TIFF or JPEG format. If you want to use an image file as an overview picture (in the Species or Introduction, for instance), the picture must have a height of 281 pixels and a width of 241 pixels. In addition, all images must be saved at 72 dots per inch (dpi) resolution and at a bit depth of 32 bits. To digitize images, you need scanning software as well as a flat-bed scanner, hand-held scanner, slide scanner, or frame grabber. You can also use a digital camera.

To reduce the size (disk space) of a file without losing image quality, save images in TIFF format using LZW compression. JPEG compression (in JPEG

files) also reduces the size (disk space) of a file, but be warned, this can lead to noticeable loss of image quality! For more information on image compression, please contact ETI.

Linnaeus also supports audio and video files in Apple's QuickTime™ format. To create an audio file, start with a quality recording of the sound or record it directly on the computer, using a sound digitizer or (if available) built-in sound recording equipment. To create a movie, begin with a quality video recording. Next, you will need a video board that creates QuickTime movies. Create the digital QuickTime movie and then save it as designated by your video hardware.

ETI organizes courses on the use of multimedia software and hardware. The course materials provide more detailed information on the use of programs like PhotoShop and hardware devices such as scanners and sound recorders. Please contact ETI to obtain these materials, to sign up for a course, or for assistance with choosing multimedia hardware and software. ETI also provides access to its multimedia lab in Amsterdam.

Never use the same name twice for two different files, even when they are in two different folders or have different formats (e.g. when one is a text file and the other an audio file). You should also avoid nondescriptive file names, abbreviations, and numbering schemes.

Multimedia files should be placed in one of four subfolders of the Multimedia folder (Pictures, Sounds, Movies, and Text) within the main Linnaeus II folder. When a folder contains more than 200 files, you should create new subfolder(s) within that folder and divide the files between them. For instance, you can create an Overview Pictures subfolder within the main Pictures folder. However, you must tell Linnaeus about the existence of any new folders. To do this, choose Edit Paths... from the File menu and then click on Add... (see the section on "Customizing your project").

The easiest way to provide access to multimedia files is to place them in the Multimedia field of a module. For instance, a picture of a species should be placed in the Multimedia field of the page for that species in the Species module. To change the contents of a Multimedia field, choose Edit Multimedia... (Ctrl+E) from the Entry menu. You can also click in the Multimedia field when the fields are unlocked (click on the lock icon to unlock the fields of a module).

This command opens the Edit Multimedia dialog box, where you can add or remove files from the list. You can also click on the Caption... button to attach a "caption" to a file that provides users with additional information about that file. The caption is shown in [brackets] behind the file name in the list. To remove a caption, click on Caption..., press Backspace to delete the text, and then click on OK.

The second way to attach multimedia to your project is to insert links to multimedia files into the text. In the description of a species, for instance, you could insert a link to a distribution map picture following a description of that species' geographical distribution.

To insert a multimedia file link into the text, first unlock the fields of the module (by clicking on the lock icon) and place the cursor into the text where you want to insert the link. Next, go to the Insert submenu of the Edit menu, and choose Multimedia File... from the submenu. Finally, choose the file that you want to insert from the file dialog box. The blue-colored link will now be inserted into the text. When you lock the field and click on the link, the linked multimedia file will open automatically in a new window.

You can also link multimedia files to character states in an IdentifyIt file. For more information, see the section on IdentifyIt.

Importing text

Linnaeus II offers a powerful text import feature. You can import text from a plain text file, a Rich Text Format (RTF) file, a Linnaeus 1.*x* file, or a Linnaeus 2.*x* file.

To import text, choose Import Text... from the File menu. You are now presented with a file dialog box where you can choose the file that you want to import. This can be either by a text file, a Linnaeus 1.*x* module, or a Linnaeus 2.*x* module.

Importing from an older version of Linnaeus. To import from a file made with Linnaeus II versions 1.0 to 1.2, select Import Text... from the File menu, then select the file from which you want to import.

If you try to import a page that already exists, you can choose to replace it or add the new page under a different name. You can also click on Replace All to automatically replace all existing pages.

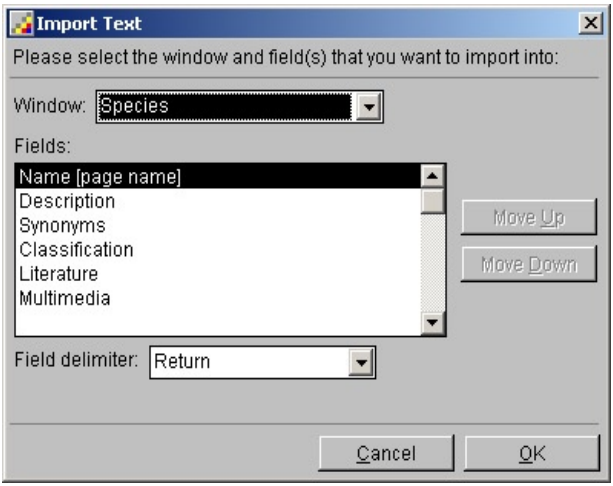
Importing from a module. To import from a Linnaeus II 2.*x* module (created in Linnaeus versions 2.0 up to 2.5), select Import Text... from the File menu and then choose it from the file dialog box. Select the pages that you want to import and click OK, or click Import All to import all pages.

You can also import a key; this will replace all existing information currently contained in that key. In other words, you cannot use the import function to modify an existing key. To import into MapIt, you must use the Export Objects... command to first export the data to a file, and then import the data back into MapIt using the Import Objects... command.

Importing from a text file. Importing from a text file (saved as "text-only" in your word processor) or RTF file is more complex because you must tell

Linnaeus II what the format of the data is, and where you want to import the text. Select the window from the dropdown menu, then click in the list to select the fields to import into. You can specify in which order the text should be imported into the fields by clicking on the "Move Up" and "Move Down" arrow buttons. Finally, you must specify the field delimiter, i.e., the character(s) that will be placed between the text of each field in order to separate them. The delimiter that you use to separate fields must be identical to the delimiter used to separate pages, i.e., the characters used to separate the last field of a page and the first field of the next page. You can use one of the standard delimiters (carriage return, tab, double carriage return, or double tab), or use one or more unusual characters that you are certain do not occur in the text itself (such as "∞" or "Δ").

If you have a list of species names that is return-delimited (one name per line), you can automatically create pages for them in the Species module. To do so, choose Import Text... from the File menu and select the text file from the dialog box, then select Species from the window dropdown menu, click on "Name [page name]" in the list of fields (and de-select any other fields), choose "Return" from the field delimiter dropdown menu, and click on OK.



Linnaeus II lets you import from a text or RTF file.

When you import from a Rich Text Format (RTF) file, Linnaeus II will keep the text's bold, italic, and underline formatting, but ignore all other formatting, including fonts and sizes.

The Navigator module

The Navigator module opens automatically when you launch Linnaeus II. It acts as the central point or "main menu" of your project. Use it to navigate around Linnaeus II and to store information on scientists, students, publishers, and other contributors.

The buttons that lead to the various modules are visible only when 1) the Contents field is visible and 2) the fields are locked. They disappear as soon as you click on the "Welcome," "Contributors," or "About ETI" tab, or when you click on the lock icon to unlock the fields.

You can move any of the module buttons around in the window by holding down the Control key and dragging it. The buttons are added and removed automatically when you use the advanced feature Edit Modules... in the File menu (see the section on "Customizing your project").

Choose Get Info from the Entry menu to find out what the location and file size of the Navigator module is.

The text in the "About ETI" field cannot be changed by anyone except ETI staff.

The Introduction module

Use the Introduction to enter general and introductory material on your group; you can also store other information here on topics such as methodology. To open the Introduction, click on its icon in the Navigator, or choose it from the Window menu.

In the Introduction window, click on the Next and Previous buttons to leaf through the pages of the Introduction, or click on Contents to see the list of pages in the Introduction and jump to any of them.

The Introduction does not have any "tabs" along the top of the window because it contains one text field only. To edit the text, click on the lock icon.

To add a page to the Introduction, choose New Topic... (Ctrl+N) from the Entry menu and then enter the name of new page. You can change the name of the current page by choosing Rename Topic...(Ctrl+R) from the Entry menu, or remove one or more pages from the Introduction using the Delete Topics... command. To change the order of the pages in the Introduction, select Sort Topics... from the Entry menu. This opens the Sort Topics dialog box, where you can click on the Move Up and Move Down buttons to rearrange the pages, or click on the Sort Alphabetically button to arrange the pages in alphabetical order. You can also add and remove topics in this dialog box by clicking on Add... or Remove.

On any page in the Introduction, you can display an overview picture next to the text by choosing Show Picture... from the Entry menu and then selecting a TIFF or JPEG file from the file dialog box. The picture must be 241 pixels horizontally and 281 pixels vertically. Remove the overview picture by choosing Hide Picture from the Entry menu. You can also click on the Hide Picture button in the bottom left corner of the window to hide the picture and give more space to the text; click again on the button (now called Show Picture) to display the overview picture again.

Choose Get Info from the Entry menu to find out how many pages the Introduction contains, as well as the location and file size of the module.

The Species module

Use the Species module to store descriptions of species within your taxonomic group, as well as subspecies and other taxa below species level. This information can be text (descriptions, synonyms, common names, taxonomic information, references, etc.) or multimedia (photographs, drawings, audio, video). Taxa above species level should be stored in the Higher Taxa module. To open the Species module, click on its icon in the Navigator, or choose it from the Window menu.

The module contains one page for each species. Click on the Next and Previous buttons in the Species window to leaf through the pages, or click on Contents to see the list of pages and jump to any of them.

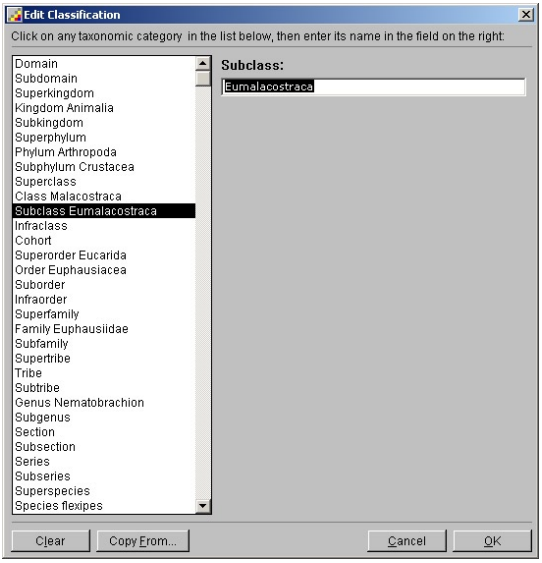
The name of the current species is shown in blue along the top of the window. Click on the "tabs" to switch between text fields. When the field name shown on the tab is "grayed out," the field is empty on that page. To unlock the fields and edit the text in them, click on the lock icon.

Add another page to the Species by choosing New Taxon... (Ctrl+N) from the Entry menu. This command opens a dialog box where you can select the taxonomic level of the new taxon (species or a subspecific taxonomic level) and enter its name. If you're entering a species, you can click on the Genus... button to insert the name of a genus into the first word of the name field; or if you're entering a subspecies, click on the Species... button to insert the name of a species into the first two words of the name field. Then choose which fields you want to copy from the current page to the new page. For example, if you add a new species belonging to same genus as the current species, select Classification to copy the higher taxonomic classification in the Classification field of the current taxon to the Classification field of the new taxon. Otherwise, the Classification field of the new species will be automatically copied from a species within the same genus, if available.

You can change the name of the current species by choosing Rename Taxon...(Ctrl+R) from the Entry menu, or remove one or more pages from the Species using the Delete Taxa... command. To change the order of species, select Sort Taxa... from the Entry menu and then choose whether you want to sort them alphabetically, by taxon (all species together, all subspecies together etc.), in taxonomic order (alphabetically, based on the contents of the Classification field on each page), or in custom order. If you choose "Custom order ...", the Sort Taxa dialog box will open. Here, click on the Move Up and Move Down buttons to rearrange the pages, then click on OK.

Use the Description field to enter a standard taxonomic description of the taxon. What is standard differs from one taxonomic group to the next and should therefore be decided by the author (or group of authors) on the basis of current usage in the area of expertise. Use a concise, but not telegraphic, style of writing. The Description field can also contain the name of the author and the year of publication, as well as information on ecology, morphology, etc.

The Classification field lists the current taxonomic hierarchy for the species. List only those categories which are really functional for your group of organisms. Botanists are invited to read "division" where it says "phylum." To enter the higher taxonomic classification of a taxon or change the contents of the Classification field, choose Edit Classification... (Ctrl+J) from the Entry menu, or unlock the fields (by clicking on the lock icon) and click in the Classification field. This command opens the Edit Classification dialog box.



Use the Edit Classification dialog box to enter the higher taxonomic classification of a species or another taxon.

Click in the field on the left to select a taxon, and then enter its name into the field on the right. If you selected kingdom or phylum, you are presented with a list from which you can choose a taxon name, or you can enter another name. Click on Clear to remove all taxon names. Click on Copy From.. to copy the taxonomic classification of a species or other taxon to the taxonomic classification of the current taxon. For instance, when entering a species, you can copy the taxonomic classification of the genus or a species in the same genus, saving you the trouble of re-entering the taxonomic classification for each taxon you add to the Species module.

To assign multimedia files to a species, choose Edit Multimedia... (Ctrl+E) from the Entry menu, or unlock the fields and click in the Multimedia field. This opens the Edit Multimedia dialog box, where you can add or remove files, or copy them from another taxon (see the section on "Working with multimedia").

We recommend that each page in the Species have an overview picture representing the overall morphology of the taxon. The overview picture is displayed to the right of the text. After you click on OK in the Edit Multimedia dialog box, Linnaeus II automatically searches for the first TIFF or JPEG file in the list with a width of 241 pixels and a height of 281 pixels and assigns it as the overview picture of that taxon. You can click on the Hide Picture button in the bottom left corner of the Species window to hide the overview picture and give more space to the text; click again on the button (now called Show Picture) to display the overview picture again.

The Synonyms field holds any scientific synonyms for the taxon name as well as common (vernacular) names. When entering scientific synonyms for a taxon into the Synonyms field, make sure each name is followed by a vertical line (|). This will enable the synonym to be included in the Index when you choose Update Index from the Entry menu in that module. The vertical line should follow the actual name but precede the additional info, e.g., *Dugestia festae* | n. sp. Borelli, 1898. The vertical lines will be removed by ETI staff during finalization of your project.

Common names should be followed by the language in [brackets]. For more about common names, see the section on the Index module.

To simplify entry of literature references and ensure that the reference is identical in the taxonomic databases (Species and Higher Taxa), you must enter literature references directly into the Literature module (see that section). You can add the name of the current taxon to the Key words field of one or more references in the Literature by selecting Link to References... from the Entry menu.

Choose Get Info from the Entry menu to find out how many pages the Species contains, as well as the location and file size of the module.

The Higher Taxa module

The Higher Taxa module holds information on taxa above species level – from domain down to superspecies. This information can be text (descriptions, synonyms, common names, taxonomic information, references, etc.) or multimedia (photographs, drawings, audio, video). Species and taxa below species level should be placed in the Species module. To open the Higher Taxa, click on its icon in the Navigator, or choose it from the Window menu.

The module contains one page for each higher taxon. Click on the Next and Previous buttons in the Higher Taxa window to leaf through the pages, or click on Contents to see the list of pages and jump to any of them.

The name of the current taxon is shown in blue along the top of the window. Click on the "tabs" to switch between text fields. To unlock the fields and edit the text in them, click on the lock icon.

Add another page to the Higher Taxa by choosing New Taxon... (Ctrl+N) from the Entry menu. This command opens a dialog box where you can select the taxon from the dropdown menu and enter its name into the text box. Then choose which fields you want to copy from the current page to the new page and click OK. You can change the name of the current taxon by choosing Rename Taxon... (Ctrl+R) from the Entry menu, or remove one or more pages from the Higher Taxa using the Delete Taxa... command. To change the order of the taxa, select Sort Taxa... from the Entry menu and then choose whether you want to sort them alphabetically, by taxon (all orders together, all families together etc.), in taxonomic order (alphabetically, based on the contents of the Classification field on each page), or in custom order. If you choose "Custom order ...", the Sort Taxa dialog box will open. Here, click on the Move Up and Move Down buttons to rearrange the pages, then click on OK.

To enter the higher taxonomic classification of a taxon or change the contents of the Classification field, choose Edit Classification... (Ctrl+J) from the Entry menu, or unlock the fields (by clicking on the lock icon) and click in the Classification field. This command opens the Edit Classification dialog box. Click in the field on the left to select a higher taxon, and then enter its name into the field on the right. If you selected kingdom or phylum, you are presented with a list from which you can choose a taxon name, or you can enter another name. Click on Clear to remove all taxon names. Click on Copy From... to copy the taxonomic classification of a taxon to the taxonomic classification of the current taxon. For instance, if you are entering the taxonomic classification of a genus, you can copy the taxonomic classification of a species within that genus.

To assign multimedia files to a taxon, choose Edit Multimedia... (Ctrl+E) from the Entry menu, or unlock the fields and click in the Multimedia field. This opens the Edit Multimedia dialog box, where you can add or remove files, or copy them from another taxon (see "Working with multimedia"). The Higher Taxa module does not display overview pictures.

The Synonyms field holds any scientific synonyms for the taxon name as well as common (vernacular) names. When entering scientific synonyms for a taxon into the Synonyms field, make sure each name is followed by a vertical line (|). This will enable the synonym to be included in the Index when you choose Update Index from the Entry menu in that module. The vertical line should follow the actual name but precede the additional info, e.g., Genus *Dugestia* | Borelli, 1898. The vertical lines will be removed by ETI staff during finalization of your project.

Common names should be followed by the language in [brackets]. For more information on entering common names, see the section on the Index module.

To simplify entry of literature references and ensure that the reference is identical in the taxonomic databases (Species and Higher Taxa), you must enter literature references directly into the Literature module (see that section). You can add the name of the current taxon to the Key words field of one or more references in the Literature by selecting Link to References... from the Entry menu.

Choose Get Info from the Entry menu to find out how many pages the Higher Taxa contains, as well as the location and file size of the module.

The Glossary module

The Glossary holds definitions for technical and/or scientific terms used in your project. To open the Glossary, click on its icon in the Navigator, or choose it from the Window menu.

The Glossary contains one page for each term. Click on the Next and Previous buttons in the Glossary window to leaf through the pages, or click on Contents to see the list of pages and jump to any of them.

Clicking on a word doesn't automatically look it up in the Glossary (as it did in Linnaeus 1.*x*), unless it is a blue-colored "hotword" that you've added using the Insert Page Name command. Terms found in the Glossary are marked as hotwords by ETI staff only after all data has been entered and your project is ready to be published.

Along the top of the Glossary window is an A-Z bar. Click on a letter to jump to the first term starting with that letter. If there are no terms for a

particular letter, it is "grayed out" (disabled). Click on the "tabs" to switch between the Definition, Synonyms, and Multimedia fields. To unlock the fields and edit the text in them, click on the lock icon.

Add another page to the Glossary by choosing New Term... (Ctrl+N) from the Entry menu. This command opens a dialog box where you enter the new term. Then, choose which fields you want to copy from the current page to the new page, and click OK. You can change the name of the current term by selecting Rename Term... (Ctrl+R) from the Entry menu, or remove one or more pages from the Glossary using the Delete Terms... command. To sort the terms in alphabetical order and update the A-Z bar along the top of the window, choose Sort Terms from the Entry menu.

To assign multimedia files to a term, choose Edit Multimedia... (Ctrl+E) from the Entry menu, or unlock the fields and click in the Multimedia field. This opens the Edit Multimedia dialog box, where you can add or remove files, or copy them from another term (see "Working with multimedia").

You can add a number of terms and synonyms simultaneously by choosing Word Index... from the Entry menu and then choosing in which module(s) you want to index the text. Note that this operation can take up to several hours to complete, depending on the size of the module(s) that you want to index. When it is done, Linnaeus will present the indexed words in the Word Index window. Click on a letter in the A-Z bar to see the words starting with that letter. Now you can drag words from the list and drop them in the "new terms" or "new synonyms" field. When you drag a word to the synonyms, you also have to assign it to a term.

The Word Index lets you add terms and synonyms to the Glossary in one step.

Click on Save... to export the word index to a file, so you can go through the list at another time to find the terms and synonyms that need to be defined in the Glossary.

Choose Get Info from the Entry menu to find out how many pages the Glossary contains, as well as the location and file size of the module.

The Literature module

The Literature module contains literature references for your taxonomic group. To open the Literature, click on its icon in the Navigator, or choose it from the Window menu.

The Literature contains one page for each reference. Click on the Next and Previous buttons in the Literature window to leaf through the pages, or click on Contents to see the list of pages and jump to any of them.

Unlike the "References" stack in Linnaeus II version 1.*x*, the Literature module requires that each page be named. The name of the current reference is shown in blue.

Along the top of the Literature window is an A-Z bar. Click on a letter to jump to the first reference starting with that letter. If there are no references for a particular letter, it is "grayed out" (disabled). Click on the "tabs" to switch between the Reference and Key words fields. To unlock the fields and edit the text in them, click on the lock icon.

To simplify entry of literature references and ensure that each reference is identical in the Literature and the Species and Higher Taxa modules, you must enter literature references directly into the Literature module and assign species and other taxa as key words. When you have entered all the references into the Literature and added the proper key words for each, choose Update Literature from the Entry menu to copy each reference to the Literature field of the taxa in the Higher Taxa and Species that have been assigned as key words to that reference.

To edit the key words of the current reference, choose Edit Key words (Ctrl+E) from the Entry to open the Edit Key words dialog box. Click on Add... to add taxa names or other key words to the list. You can also copy the key words from the Key words field of another reference by clicking on the Copy From... button. To remove key words, select one or more key words in the list and click on Remove. You can change the order of the key words by selecting one or more items in the list and clicking on the Move Up and Move Down buttons. Click on Sort to sort the items in the list in alphabetical order, or close the Edit Key words dialog box and choose Sort Key words... from the Entry menu.

Add another page to the Literature by choosing New Reference... (Ctrl+N) from the Entry menu. This command opens a dialog box where you enter the name of the new reference. Choose whether the reference has one, two, or multiple authors, enter the name(s) of the author(s) and year of publication, specify whether you want to copy the key words from the current reference to the new reference, and click on OK.

You can change the name of the current reference by choosing Rename Reference... (Ctrl+R) from the Entry menu, or remove one or more pages from the Literature using the Delete References... command. To sort the references in alphabetical order and update the A-Z bar along the top of the window, select Sort References from the Entry menu.

When you import literature references from a text, RTF, or Linnaeus 1.*x* file (see the section on "Importing text"), new pages will be named "Untitled *x*," where *x* is a number. After the import is done, you must give every "Untitled" page its proper name by turning to that page and choosing Rename Reference... (Ctrl+R) from the Entry menu. The program will suggest a page name to you, so in most instances all you have to do is click OK (or press Enter).

Choose Get Info to find out how many pages the Literature contains, as well as the location and file size of the module.

References should be entered in the following formats:

► single-author paper:

Sluys, R., 1990. On *Bdellasimilis barwicki* (Platyhelminthes: Tricladida) and its phyletic position. Invertebr. Taxon. 4: 149-158.

► double-author paper:

Franzèn, A. and B. J. Afzelius, 1987. The ciliated epidermis of *Xenoturbella bocki* (Platyhelminthes, Xenoturbellida) with some phylogenetic considerations. Zool. Scr. 16: 9-17.

► multiple-author paper:

Jennings, J. B., L. R. G. Cannon and A. J. Hick, 1992. The nature and origin of the epidermal scales of *Notodactylus handschini* - an unusual Temnocephalid turbellarian ectosymbiotic on crayfish from Northern Queensland. Biol. Bull. 182: 117-128.

► chapter in a book:

Karling, T. G., 1974. On the anatomy and affinities of the turbellarian orders. In: N. W. Riser & M. P. Morse (eds), Biology of the Turbellaria, McGraw-Hill, New York: 1-16.

► book:
Margulis, L. and K. V. Schwartz, 1988. Five Kingdoms. W. H. Freeman & Company, New York. 376 pp.

► edited book:
Ainsworth, G. C. & A. S. Sussman (eds), 1965-1973. The fungi. 4 vols., Academic Press, New York.

The Index module

The Index lists all the species and other taxa described in the taxonomic database modules (Species and Higher Taxa), including scientific synonyms, common (vernacular) names and epithets. To open the Index, click on its icon in the Navigator, or choose it from the Window menu.

Click on the "tabs" to switch between the Species and Lower Taxa, Higher Taxa, and Common Names fields. You cannot edit the text in the fields; to update the lists, choose Update Index from the Entry menu. Note that this operation may take a long time to complete, depending on how many taxa you have entered.

The "Species and Lower Taxa" field is an alphabetical list of all taxa (species as well as subspecies and other taxa below species level) with a page in the Species module, while the "Higher Taxa" field is an alphabetical list of all taxa above species level that have a page in the Higher Taxa modules. The names of taxa that have a page in one of the two taxonomic database modules are marked in blue. To jump directly to the page for that taxon, click on its name.

The Species and Lower Taxa and Higher Taxa fields can also include scientific synonyms for taxa. Refer to the sections on the Species and Higher Taxa modules for further information on how to include synonyms in the Index.

Click the "Common Names" tab to display the common names of species and other taxa. If common names are available in more than one language, you can switch to another language by choosing it from the dropdown menu marked "Choose language:". To specify the common names of a taxon, enter them into the Synonyms field on the page for that taxon (one per line) followed by the language, which is placed between [brackets]. So, for instance, the Synonyms field for the species *Platalea leucorodia* would contain (in addition to any scientific synonyms):

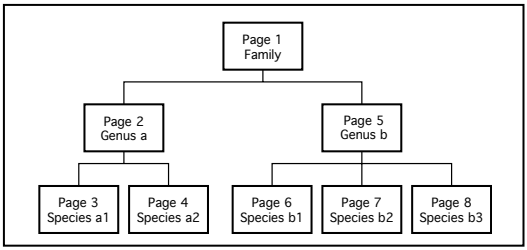
Eurasian Spoonbill [English]
Spatule blanche [French]
Löffler [German]
Espátula [Spanish]
Lepelaar [Dutch]

Alternatively, you can use each language's native name, but be consistent throughout your project — do not use "Français" in some places and "French" in others.

The Text Key

Of the three identification tools included with Linnaeus II, which let you identify a specimen based on its characters, the Text Key will be most familiar to taxonomists because it is simply an electronic version of written dichotomous keys. To open the Text Key, click on its icon in the Navigator, or choose it from the Window menu.

The Text Key has a hierarchical structure of pages that you traverse by clicking on choices. Each page has at least two and no more than four choices. You construct a key by adding choices. Pages are added automatically whenever you add a choice that leads to a new page in the key. The page numbers are also renumbered automatically when pages are added or removed.



Keys are structured hierarchically.

Choices are indicated by the page number and the letter a, b, c, or d. So, for instance, "4c" would be the third choice on the fourth page. In the bottom right corner of each choice is its destination, i.e., where you go when you click on that choice. The destination can be:

- a new page in the key
- an existing page in the key
- a species
- a higher or subspecific taxon

Click on the Previous button to undo the most recent choice that you've made and return to the page where you clicked on that choice. To undo all choices made and return to the first page in the key, click on the First button. You can jump directly to another part of the key by clicking on the Contents button and choosing the page you want from the list. You can also use the Decision Path window to jump to another part of the key.

The Decision Path window, which shows you the list of choices that you've made so far, opens when you click on the Decision Path button in the Text Key window. Click on a choice in the list to return to the page where you clicked on that choice, undoing all choices made since. Also shown are the list of possible species and other taxa based on the choices made so far, and the list of species and other taxa that your choices have eliminated from consideration; you can click on any name in one of the two lists to jump directly to the page for the appropriate taxon.

Click on Save Text... or Print Text... in the Decision Path window to export the list of choices made to a text file, or to print the list of choices made. You can also save or print the list of possible species and the list of eliminated species. Click on Find... to find a text string in the Decision Path window (click on Find in the Picture Key window to search the key itself).

An empty Text Key consists of one page and two empty choices. To start building the key, choose Edit Choice... (Ctrl+E) from the Edit menu. You can also right-click on the choice that you want to edit. This opens the Edit Choice dialog box, where you can enter the text of the choice and select its destination.

Write or paste the text into the field on the left. You can use the Insert dropdown menu to insert a multimedia file link or a page name hotword into the text. The Edit menu is also available to you. Key choices should preferably be written in 8-point Verdana.

Specify the destination of the choice on the right side of the window. Use the dropdown menu to choose whether the choice will lead to a new page (following the hierarchical structure of the key); an existing page (to jump to another part of the key); a species; a higher taxon; or a subspecific taxon. If the choice will lead to a new page, you can also specify the name of the new page and the number of choices on the new page. Else, click in the list to select the destination, then click on OK.

A page can contain up to four choices. To add another choice to the current page, select New Choice (Ctrl+N) from the Entry menu. To remove one of the choices on the current page, choose Delete Choice from the Entry menu and then click on the choice that you want to remove. When you delete a choice that leads to another page, you also delete the destination page and all pages branching from it. Linnaeus will then automatically renumber the

pages of the key. This also happens when you change the destination of a choice to a taxon or an existing page in the key.

You should name as many pages in the key to give users as many reference points as possible. For instance, if you have a page named "Genus *Platalea*," and the user knows his/her specimen belongs within that genus, he/she can save time by jumping directly to that page and starting the identification process there. You can enter the name of the new page when you choose "a new page in the key" as the destination of a choice, or select Name this Page... from the Entry menu to enter or change the name of the current page. You can also simply click on the left side of the white bar along the top of the Text Key window, where the page number and name is displayed.

On any page with just two choices, you can display an overview picture to illustrate the choices on that page by choosing Show Picture... from the Entry menu and then selecting a TIFF or JPEG file from the file dialog box. The picture must be 241 pixels horizontally and 281 pixels vertically. Remove the overview picture by choosing Hide Picture from the Entry menu.

To insert a page between the current page and one the pages leading to and from it, select Insert Page... from the Entry menu and choose where the page should be inserted. If you are on the first page of the key, you also have the option of inserting a "New page 1" before the current first page.

The Update Key command updates the information in the Decision Path window. When you click on the Decision Path button and the key needs to be updated, Linnaeus II will ask you whether you want to update the key at that time. Note that this operation may take some time to complete, depending on the size of the key.

Choose Get Info to find out how many pages the Picture Key contains, as well as the location and file size of the module. Click on More... to analyze the key and present the results in a notepad window. For instance, this will tell you whether the key contains any choices without a destination, and list the species that have not yet been included in the key.

The Picture Key

The Picture Key is similar to the Text Key, but here choices can consist of a picture only, text only, or a picture with a text caption. This module is therefore better suited to building keys for visual identification. To open the Picture Key, click on its icon in the Navigator, or choose it from the Window menu.

Like the Text Key, the Picture Key has a hierarchical structure of pages that you traverse by clicking on choices. You construct a key by adding choices.

Pages are added automatically whenever you add a choice that leads to a new page in the key. The page numbers are also renumbered automatically when pages are added or removed.

A choice can lead to:

- a new page in the key
- an existing page in the key
- a species
- a higher or subspecific taxon

Click on the Previous button to undo the most recent choice that you've made and return to the page where you clicked on that choice. To undo all choices made and return to the first page in the key, click on the First button. You can jump directly to another part of the key by clicking on the Contents button and choosing the page you want from the list. You can also use the Decision Path window to jump to another part of the key.

The Decision Path window, which shows you the list of choices that you've made so far, opens when you click on the Decision Path button in the PictureKey window. Click on a choice in the list to return to the page where you clicked on that choice, undoing all choices made since. Also shown are the list of possible species and other taxa based on the choices made so far, and the list of species and other taxa that your choices have eliminated from consideration; you can click on any name in one of the two lists to jump directly to the page for the appropriate taxon.

Click on Save Text... or Print Text... in the Decision Path window to export the list of choices made to a text file, or to print the list of choices made. You can also save or print the list of possible species and the list of eliminated species. Click on Find... to find a text string in the Decision Path window (click on Find in the Picture Key window to search the key itself).

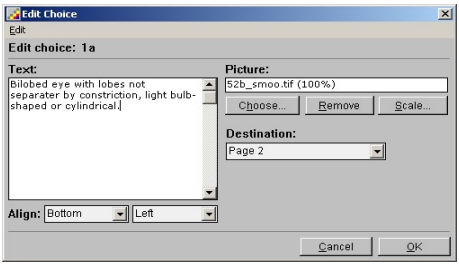
Constructing a Picture Key is similar, but not identical, to building a Text Key. An empty Picture Key consists of one page without any choices. To start, choose New Choice (Ctrl+N) from the Edit menu. This opens the New Choice dialog box, where you specify the picture and text (either or both) and destination of the new choice.

To assign a picture to the choice, click on Choose... and select a TIFF or JPEG file within the Pictures folder from the file dialog box. You will now see the name of the picture and the scale at which it will be shown on the page. To change the scale, click on Scale... and enter the new scale or drag the slider. To remove the picture from this choice, click on the Remove... button.

Write or paste the text into the field in the bottom left. You can use the Insert dropdown menu to insert a multimedia file link or a page name hot-

word into the text. The Edit menu is also available to you. Key choices should preferably be written in 8-point Verdana. If you have selected a picture, you can also specify where the text will be shown in relation to the picture, using the three dropdown menus below the text field. Before you start building the key, experiment with this feature to find the caption style that best suits to your data.

Specify the destination of the choice on the right side of the window. Use the dropdown menu to choose whether the choice will lead to a new page (following the hierarchical structure of the key); an existing page (to jump to another part of the key); a species; a higher taxon; or a subspecific taxon. If the choice will lead to a new page, you can also specify the name of the new page and the number of choices on the new page. Else, click in the list to select the destination, then click on OK.



The Edit Choice dialog box lets you specify the appearance and destination of a choice.

The new choice will now be placed in the centre of the current page of the key. You can move the choice to another location by holding down the Control key and dragging it. If the choice consists of text only, you can also resize the choice rectangle by holding down the Control key and dragging from one of its corners.

To change the picture, text, or destination of an existing choice, choose Edit Choice... (Ctrl+E) from the Entry menu and click on the choice that you want to edit. You can also right-click on the choice.

Unlike the Text Key, which can have no more than four choices on a page, the Picture Key can offer up to 26 choices(designated by the letters a through z) on a single page. To remove one of the choices on the current page, choose Delete Choice from the Entry menu and then click on the choice that you want to remove. When you delete a choice that leads to another page, you also automatically delete the destination page and all pages branching from it. This also happens when you change the destination of a choice to a species, taxon, or existing page in the key.

You should name as many pages in the key to give users as many reference

points as possible. For instance, if you have a page named "Genus *Platalea*," and the user knows his/her specimen belongs within that genus, he/she can save time by jumping directly to that page and starting the identification process there. You can enter the name of the new page when you choose "a new page in the key" as the destination of a choice, or select Name this Page... from the Entry menu to enter or change the name of the current page. You can also simply click on the left side of the white bar along the top of the Picture Key window, where the page number and name is displayed.

To insert a page between the current page and one the pages leading to and from it, select Insert Page... from the Entry menu and choose where the page should be inserted. If you are on the first page of the key, you also have the option of inserting a "New page 1" before the current first page. The inserted new page will contain one choice, with the text "This page was inserted."

The Update Key command updates the information in the Decision Path window. When you click on the Decision Path button and the key needs to be updated, Linnaeus II will ask you whether you want to update the key at that time. Note that this operation may take some time to complete, depending on the size of the key.

Choose Get Info to find out how many pages the Picture Key contains, as well as the location and file size of the module. Click on More... to analyze the key and present the results in a notepad window. For instance, this will give you a list of pictures used, tell you whether the key contains any choices without a destination, and list the species that have not yet been included in the key.

IdentifyIt

IdentifyIt™ is a multiple-entry key based on a matrix of "objects" (species and other taxa) and character states. The matrix defines each object as a series of character states. For example, the definition for an object with green eyes and four legs would contain the state "green" for the character "eyes," and the state 4 for the character "number of legs." To open IdentifyIt, click on its icon in the Navigator, or choose it from the Window menu.

In this module, you can identify a specimen by entering a "search pattern" that describes it as a series of character states. IdentifyIt then compares the search pattern to the objects in the current file and tells you the percentage match for each, so that you can find out which object is the closest match to your specimen.

The current version of IdentifyIt includes support for separation coefficients (calculating the "next best" character to add to the search pattern),

numerical characters, and import/export of Nexus format files. You can still use files made with previous versions of IdentifyIt.

Files. IdentifyIt lets you create and use "identify files," each of which contains a matrix of objects and character states. You can store these identify files in the "Identify files" folder within the main Linnaeus II folder.

IdentifyIt has been designed to allow multiple identify files for each taxonomic group. Thus, you could create one IdentifyIt file for basic taxonomic descriptions, one for ecological characteristics, and one for morphologic or structural information. Or it could be useful to create one IdentifyIt file for characters as seen in preserved specimens, and another for fresh specimens. You can also create a tree-shaped hierarchy of identify files – a "master" file with a general key for your group, leading to several other files with more detailed keys of subgroups.

When IdentifyIt first opens, a new "Untitled" file is automatically created. To open another file, click on the Open... button in the top right corner of the window or choose Open Identify File... (Ctrl+O) from the File menu. You can also create a new file by choosing New Identify File or Close Identify File. To save the latest changes to the current identify file, select Save Identify File (Ctrl+S), and to save it under another name, choose Save Identify File as... from the File menu. Select Identify File Info... from the File menu to find out where the current file is located; how large the file is; and how many objects, characters, and states it contains.

When you open an identify file made with a previous version of Linnaeus II, you should save it under another name (using the Save Identify File as... command) before continuing. The file then becomes a Linnaeus II version 2.5 identify file. Note that links between states and multimedia files are now saved in a separate file (carrying the file extension .L2L) Older link files (with the extension .LNK) will be automatically converted to the new format.

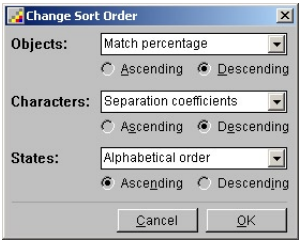
The name of the current identify file is displayed at the top of the IdentifyIt window. After you open another file, you can jump back to any of the files that you have previously opened by clicking on the file name (or on the arrow to the right of the field) and then choosing it from the list.

Modes. IdentifyIt operates in four different modes:

- identify – create a search pattern to find out which object(s) most closely match your specimen
- examine – examine the character states of an object in the current identify file
- compare – compare the character states of an object in the current identify file to another object in the file
- entry – create an identify file or make changes to an existing file

To switch from one mode to another, click on one of the tabs in the lower left corner of the IdentifyIt window.

Sort order. You can change the sort order of the objects, characters, and states by clicking on the Sort... button or by choosing Change Sort Order... from the Identify menu. This opens the Sort Order dialog box, where you can choose the sort order for each from the dropdown menus, and set the sort direction to ascending (low to high) or descending (high to low) for each. If you are editing an identify file (in entry mode), you should set the sort order to "entry order" for all three. But if you are identifying, the sort order for objects should be set to descending "match percentage," so that the object with the closest match (highest percentage) is listed first. To identify your specimen in the smallest possible number of steps, you should also set the sort order for characters to descending "separation coefficients." This will arrange the characters in order of which is the next best character to add to the search pattern. The separation coefficient values, shown to the left of the character names, are recalculated every time you change the search pattern.



Click on Sort... to change the sort order of the objects, characters and states.

Identifying. To switch to identification mode, click on the Identify tab along the bottom of the window. The field on the left contains the search pattern – the character states which you have so far defined. The field on the right lists all objects in the current file, along with the "hit" percentage for each, i.e., the match percentage based on the search pattern.

To add one or more character states to the search pattern, click on the Define... button below the search pattern field. The Define Search Pattern window will now open. Click on a character in the top list, and then click on one or several character states in the list below. If the first state selected in the list is linked to a multimedia file, that file will be automatically shown. When you choose a numerical character (a range or a distribution), you must enter the search value into the field on the right. When you choose a distribution, you also have to select the standard width from the dropdown menu below the field on the right.

When you click on OK, the selected character state(s) are added to the

search pattern and the objects' match percentages are automatically recalculated. You can jump to the page in the taxonomic databases (Species and Higher Taxa) for one of the objects by clicking on its name in the list of objects and then clicking on Go. If the object name is followed by a ">>" character, clicking on Go will open another identify file.

You can click in the search pattern to select one or more character states and then click on Remove to remove them from the search pattern. Click on Clear to clear all character states from the search pattern, or choose Clear Search Pattern from the Identify menu.

When Include Unknowns in the Identify menu has been enabled (indicated with a check mark), unknown (undefined) chararacters will be taken into consideration when calculating the match percentages. This enables IdentifyIt to deal with insufficient data in an identification matrix – incomplete data may cause some objects to be omitted from the results of the identification process, as it is impossible to calculate match percentages for such objects. When the "Include unknowns" option is enabled, an object will not be excluded from the identification process if no states are assigned to a particular character. For a good and reliable identification, this function is enabled by default. After a search pattern has been defined that results in a limited list of objects with a 100% score, it is advised to turn off the "Include unknowns" option and check if the list of matching objects is significantly reduced. If this is the case, omissions in the data matrix have played an important role during the identification. In such a scenario, the most reliable way to correctly identify your object would be to turn the "Include unknowns" option on again and to use the Examine mode for the remaining objects to check the best match of characters and states.

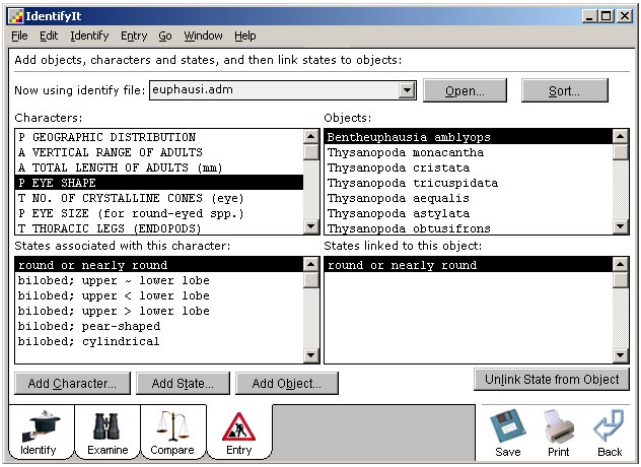
Examining an object. To switch to examination mode, click on the Examine tab along the bottom of the window. Now you can examine the definition of each object in the current identify file. Choose the object that you want to examine from the dropdown menu marked "Examine this object". The character states for the selected object will now be listed in the field. Click on "Table" to list the characters in one column and the states in another, or on "Text" to present the program's best attempt at an object description in plain English.

Comparing two objects. To switch to comparison mode, click on the Compare tab along the bottom of the window. Now you can compare the description of one object to that of another. Choose the objects that you want to compare from the dropdown menus marked "Compare this object:" and "to:". The field will now display the character states for the both objects. Click on Object to sort the list by object, or on Character to sort it by character.

The taxonomic distance between the two objects is calculated and shown

below the field. Click on the Formula... button to choose the formula that you want to use to calculate this value. Here you will also find some other useful statistics: the number of character states unique to each object; the number of states present in both objects; and the number of states absent from both.

Entry. To switch to entry mode, click on the Entry tab along the bottom of the window. Now you can make changes to the objects, characters, and states in the current identify file.



In entry mode, you can make changes to an identify file.

Adding characters. The top left field lists the characters contained in the current file. Go to the Character submenu of the Entry menu to find the commands for entering and changing characters. To add another character, click on the Add Character... button or choose Add Character... (Ctrl+R) from the Character submenu, then enter the name of the new character and choose its type. There are seven types of characters, which can be divided into three categories:

- plain character: "text"
- multimedia characters: "long text," "picture," "movie," and "sound"
- numerical characters: "range" and "distribution"

Use one of the multimedia types if you want to link a multimedia file to some or all of that character's states. For instance, you can assign the "picture" type to an external character, so that each state can be illustrated with a picture, while the "long text" type should be used when you need to present lengthy descriptions of each state in separate text files.

A character's type is shown as a small icon to the left of its name. You can change the type of a character by choosing Change Character Type... from the Character submenu. You can also change the type when you select Rename Character... However, you cannot change the character type of a numerical character, and you cannot change a "text" or multimedia character to a numerical character. And if you change the type of a multimedia character, its states will no longer be linked to any multimedia files.

The Add Character... command adds a character to the bottom of the list of characters (sorted in entry order). Use Insert Character... to add a character before the one that is selected in the list. You can also change the entry order of the characters by selecting Change Entry Order... This opens a dialog box where you can click on the Move Up and Move Down buttons to rearrange the characters. Choose Rename Character... to change the name and/or type of the selected character, and choose Remove Character... to delete the selected character.

Adding states. The states of the selected character are shown in the bottom left field. Go to the State submenu of the Entry menu to find the commands for entering and changing states. To add a state, click on the Add State... button or choose Add State... (Ctrl+E) from the State submenu, then enter the name of the new state and click OK. The new state will now be added to the bottom of the list. Choose Rename State... to change the name of the selected state and Remove State... to delete it.

To add a state for a numerical character, you also choose Add State... (Ctrl+E) from the State submenu. If the character type is "range," this will open the Add Range dialog box, where you can enter the minimum and maximum values of the numerical range. If the type is "distribution," you must specify the mean value and standard deviation. To change the values of a numerical state, choose Change State... from the State submenu.

To attach a multimedia file to the state of a "long text," "picture," "movie," or "sound" character, select Link File to State... (Ctrl+J) from the State submenu and then choose the file from the file dialog box. Picture files must be in TIFF or JPEG format and have a width of 241 pixels and a height of 281 pixels. IdentifyIt will then create a separate file to store the multimedia file links. The link file is in the same folder as the current identify file and its name is identical to that of the identify file, but followed by the extension ".L2L". To remove the multimedia file link for the selected state, choose Unlink File from State from the State submenu.

Adding objects. Now you are ready to start adding objects (taxa) to the file and defining them as a series of character states. The top right field lists the objects contained in the current file. Go to the Object submenu of the Entry menu to find the commands for entering and changing objects. To

add another object, click on the Add Object... button or choose Add Object... (Ctrl+N) from the Object submenu. The Add Object dialog box will now open. Here, enter the name of the new object, or click on Choose... and select a name from the list of objects that have not yet been added. Check off "Duplicate current object" to make a copy of the object currently selected in the list, or leave it unchecked to create an undefined (empty) object. Finally, click on OK to add the new object to the current identify file.

Use Insert Object... to add an object before the one that is selected in the list. You can also change the entry order of the objects by selecting Change Entry Order... from the Object submenu. This opens a dialog box where you can click on the Move Up and Move Down buttons to rearrange the objects. Choose Rename Object... to change the name of the selected object, and choose Remove Object... to delete the selected object.

You define an object by linking character states to it. First click in the list of character states (in the top left corner of the window) to select a character, and then click in the list of states (in the bottom left corner) to choose the state that you want to link to the selected object. Then, choose Link State to Object from the Entry menu or click on the Link State to Object button to add that character state to the object's definition. To remove a character state from the object's definition, click on it in the bottom right field, which lists the linked states for the selected character and object, and then choose Unlink State from Object from the Entry menu or click on the Unlink State from Object button. To see the list of all character states linked to the selected object, switch to examination mode by clicking on the Examine tab along the bottom of the window.

You can link the currently selected state to several objects simultaneously by choosing Link State to Objects... from the Entry menu, and then clicking in the list to select the objects to which you want to link the selected state. If you want to unlink all states for the selected character from the currently selected object, choose Unlink All States from Object from the Entry menu. You can also unlink the selected state from all objects in the current identify file by choosing Unlink State from All Objects from the Entry menu.

You can also link objects to another identify file. For instance, you can create a "master" identify file for your entire taxonomic group in which each object is a family, so that you can identify down to family level. You then create a separate identify file for each family, and link each object in the master file to the identify file for that family, which lets users identify down to species level. When an object is linked to another identify file, its name is followed by a ">>" character. When you are in identification mode, you can click in the list of objects to select such an object, then click on Go to open the identify file to which that object is linked. You can then click on Back to

return to the parent file.

To link an object to an identify file, choose Link Identify File to Object... from the Object submenu and then select the target file from the file dialog box. To remove the file link, use the Unlink Identify File from Object command.

You can export the description of one or more objects to a file by choosing Save Object Descriptions... from the Object submenu of the Entry menu, then enter the file name in the file dialog and click in the list to select the objects that you want to save to file. The description is identical to the one shown in Examine mode when you list the characters in text rather than table format. You can also copy object descriptions directly to the taxonomic database modules (Species and Higher Taxa) by selecting Copy Object Descriptions... This handy feature lets you create a Linnaeus II database from an identify file in a single step. It copies the description of each selected object to the Description field on the page for that species or taxon in the taxonomic database modules, automatically adding pages where needed. However, the selected object names may not be abbreviated, and must be identical to their names in the taxonomic database modules.

After selecting Copy Object Descriptions..., choose the object(s) that you want to copy to the taxonomic databases from the list or click on Copy All.

Importing and exporting. Choose Export to Nexus File... from the File menu to save a file in Nexus format, which can by used directly in PAUP, MacClade, and other matrix-based taxonomic programs that support this format. You can also open Nexus files and save them in IdentifyIt format by selecting Import from Nexus File... from the File menu.

Importing Nexus files into IdentifyIt is subject to the following requirements:

- The Nexus file must specify either "Charlabels" or "Taxlabels," depending on whether the matrix includes character or taxon names. In both cases, IdentifyIt will produce a taxon versus character matrix.
- The Nexus file must include a "Statelabels" block containing a description of all states for each character. This is because identification in IdentifyIt is done by way of the character states.
- The string of character state codes in the matrix must be uninterrupted (without separators such as spaces, carriage returns, or paragraph markers).

When working with Nexus files, you should realize that this format has some limitations which have implications on data transfer. For example,

feature and state descriptions and taxon names are limited to 31 characters in length. For most output, PAUP further truncates the text to 10 characters. See the MacClade and PAUP manuals for further specifications.

Nexus files exported from DELTA can be imported into IdentifyIt without difficulty, provided that the string of character state codes in the matrix is uninterrupted (without separators such as spaces, returns, or paragraph markers). This requires an additional step. You can either:

- open and subsequently save the DELTA file in MacClade, then import this MacClade file into IdentifyIt by choosing Import from Nexus File... from the File menu; or
- open the DELTA file in a text editor (such as Notepad) and make the character state strings uninterrupted by hand, then save the changes and import this text file into IdentifyIt by choosing Import from Nexus File... from the File menu.

Furthermore, Nexus files in DELTA format sometimes contain separators inside a state description (in the "Statelabels" block). These separators should be removed, or else the state will be transposed into two separate states.

Choose Export Objects... from the File menu to export a list of all objects in the current identify file, along with the character states defined for each object, and select Export Characters... from the menu to export a list of all characters in the file, along with the states defined for each.

MapIt

MapIt is a grid-based biogeographical information system that lets you enter geographical data for species and other taxa, such as distributions and type localities. The data can then be used to, among other things, search for taxa occurring in a particular geographic region, compare the distribution of a taxon to that of another, or display species/taxon richness. To open MapIt, click on its icon in the Navigator, or choose it from the Window menu.

Modes. MapIt operates in five different modes:

- examine — examine the distribution of an object
- compare — compare the distribution of an object to the distribution of another object
- search — perform a geographical search for objects
- diversity — display species/taxon richness, i.e., the number of objects

occurring in each square
- entry — enter objects and edit object distributions

To switch from one mode to another, click on one of the tabs in the lower left corner of the MapIt window.

Objects and maps. Like IdentifyIt, MapIt also works with "objects" such as species and other taxa. The distribution of an object can be entered and displayed on a number of maps. The standard maps consist of a global overview map and five maps with greater detail (North Atlantic, South Atlantic, North Pacific, South Pacific, and Indian Ocean). To switch to one of the other maps, choose it from the Map menu. In Examine mode, you can also click in the map to switch to another map that covers the coordinates where you clicked.

Contact ETI for assistance with adding maps down to any level of detail. For instance, if your taxonomic group occurs primarily in Southeast Asia, ETI can provide you with a MapIt module containing overview and detailed maps for this specific region.

MapIt displays the distribution of an object as a number of squares on the grid of the current map. To show and hide the grid covering the map, use the Show Grid command in the Map menu. The Information window, which floats above the MapIt window in a separate "palette" window, tells you what the coordinates (latitude and longitude) and diversity (richness) are at the current location of the cursor. To show and hide the Information window, use the Show Information command in the Map menu.

You can switch to another map by selecting its name from the Map menu.

Color layers. Each of the squares that make up the distribution of an object can be in one of 11 colors. For instance, one color can indicate sum-

mer distribution, a second color winter distribution, and a third year-round distribution.

These colors are shown in the Legend, which floats above the MapIt window in a separate "palette" window. To show and hide the Legend, use the Show Legend command in the Map menu. To enter or change the name of a color layer, click on it in the Legend and then choose Name Color Layer... from the Entry menu, or double-click on the name of the color layer in the Legend. You can also assign a different color to a layer by switching it with another (unused) color layer. To do this, click on a color layer in the Legend, choose Switch Layers... from the Entry menu, and then enter the number of the layer (between 1 and 11) that you want to switch with the selected layer. Note that this affects all maps of all objects.

To the left of each color in the Legend is a check box which indicates whether the layer is active or not. To deactivate a layer, uncheck the box next to it. Inactive layers are hidden in examine mode, and are also ignored in search, compare, and diversity mode.

Entry. To switch to entry mode, click on the Entry tab along the bottom of the window. Now you can enter or change the distribution of one or more objects. Select the object that you want to edit by clicking on the object name (or on the Choose... button to the right of the field) and then choosing it from the list.

To add another object, choose Add Object... (Ctrl+N) from the Entry menu. The Add Object dialog box will now open. Here, enter the name of the new object, or click on Choose... and select a name from the list of objects that have not yet been added. Check off "Copy distribution of current object" to make a copy of the current object, or leave it unchecked to create an undefined (empty) object. Finally, click on OK.

Choose Rename Object... (Ctrl+R) to change the name of the selected object, Remove Objects... to delete one more objects, and Sort Objects... to rearrange the objects or sort them in alphabetical order. To change the distribution of the current object, choose a color layer by clicking on it in the Legend, then simply click in the map to add or remove squares. You can also drag the mouse on the map to add or remove a rectangular area of squares. Clear all squares on the current map for the current object by selecting Clear Map... from the Entry menu.

If you are using an overview map and several detail maps, you should enter your data on the detail maps and then let MapIt transfer the distribution data to the main map. Transferring data is also useful if your maps partially overlap.

To transfer map data, choose Transfer Map... (Ctrl+J) from the Entry menu. This opens the Transfer Map dialog box, where you must specify:

- objects: the object(s) for which you want to transfer map data
- source maps: the map(s) that you want to transfer data *from*
- destination maps: the map(s) that you want to transfer data *to*

Map transfers add to existing data on the target map(s) rather than replacing it. To clear old data before transfer, use the Clear Map... command.

When you transfer data to a map with less detail (e.g. from the North Atlantic map to the World map), differently colored squares on the source map may be transferred to the same square on the destination map. In such cases, the target square will be assigned to the color layer that is highest up in the list in the Legend. You can specify a custom priority order by clicking on the Layers... button in the Transfer Map dialog box to open the Layers dialog box. Here you can change the priority order by selecting one or more layers in the list and clicking on Move Up or Move Down; click on Default Order to restore the order to the one given in the Legend. If you specify a custom priority order, it will be applied to all map transfers until you exit Linnaeus II.

After adding or deleting objects, or editing the distribution of one or more objects, choose Update Diversity Index from the Entry menu to update the values for the diversity index, i.e., the information about the number of objects occurring in each square.

You can export objects to a MapIt file using the Export Objects... command, and import objects from a MapIt file by choosing Import Objects... from the Entry menu.

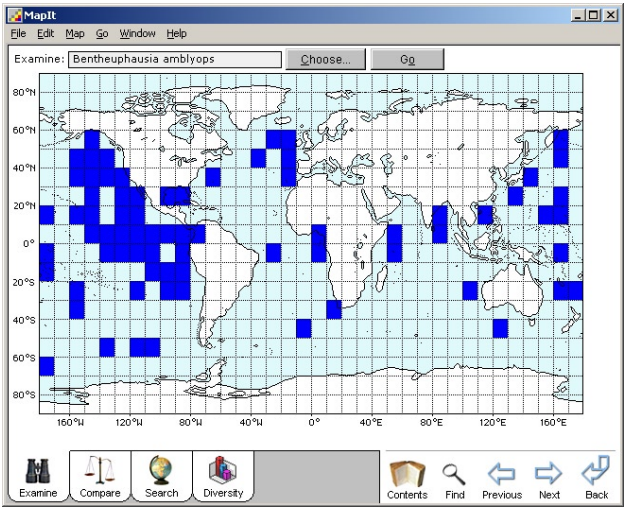
Type localities. You can attach up to eight type localities to an object. Each type locality must have a specific set of coordinates, and is shown on all maps for the current object which cover those coordinates. The type localities for the current object are listed in the Type Localities "palette" window, which you can show and hide using the Show Type Localities command in the Map menu.

To add a type locality, choose Add Type Locality... from the Entry menu, enter its longitude, latitude, and (optionally) text description, and then click on OK. Click in the Type Localities window to select a type locality and then choose Change Type Locality... to change its coordinates or text, or select Delete Type Locality to delete the selected type locality. You can also use this feature to attach other coordinates-based data to an object.

Examining an object. To switch to examination mode, click on the Examine tab along the bottom of the window. Now you can examine the distribution of an object. Choose the object that you want to examine by clicking on the object name field (or click on the Choose... button to the right of the field) and then selecting the object you want from the list. You can also use

the Next and Previous buttons, or click on Contents or Find to find an object by name. Click on Back to return to the most recently displayed object.

The map will now display the distribution of the selected object, but only active color layers are shown (you can activate and deactivate layers by clicking on the check boxes in the Legend). Click on Go to jump to the page in the proper taxonomic database module (Species or Higher Taxa) for the current object. Click on the More Info... button in the Information window to obtain more information about the current object. To export the distribution of one or more objects to a file, choose Save Text... from the File menu. In the Save dialog box, select Objects from the list and check off "Include map data," then click on OK to save the data to a file.



MapIt displays the distribution of a taxon as a series of grid squares.

Click on the map to open the Switch dialog box, which lists the maps covering the coordinates where you clicked. To switch to another map, click in the top list; to examine another object, click in the bottom list. Then click on OK to examine the selected object on the selected map. Click on Objects... to list all the objects that occur in the grid square where you clicked. Select an object from the list and click OK to display the distribution of that object.

Comparing two objects. To switch to comparison mode, click on the Compare tab along the bottom of the window. Now you can compare the distribution of one object to that of another. Click the Choose... buttons to select the objects that you want to compare.

Grid squares where both objects occur are colored purple, while squares where only one of the objects occurs are colored blue or red, depending on which object occurs in that square. Click on the More Info... button in the

Information window to obtain more information about the most recent comparison. To export the results of the most recent comparison to a file, choose Save Text... from the File menu. In the Save dialog box, select Comparison from the list and click on OK.

Geographical searches. To switch to search mode, click on the Search tab along the bottom of the window. Now you can perform a geographic search for objects occurring in one or more grid squares on the map.

First, click on the squares where you want to search. You can also drag the mouse on the map to select a rectangular area of squares, or click on the Clear Map button to clear all selected search squares. The selected search squares are colored light green. Then, execute the search by clicking on the Search button.

The Objects Found window, a "palette" floating above the MapIt window, will now open to list the objects that occur in one or more of the selected search squares. Click on a name in the list to examine the distribution of that object. To show or hide the Objects Found window, use the Show Objects Found command in the Map menu. Click on the More Info... button in the Information window to obtain more information about the most recent search. To export the results of the most recent search to a file, choose Save Text... from the File menu. In the Save dialog box, select Search from the list and click on OK.

If you've deactivated one or more color layers using the check boxes in the Legend, those layer(s) will be ignored in the search. This allows you to search in specific color layers. For instance, if you have defined three layers as "Summer distribution," "Winter distribution," and "Year-round distribution," you can turn off the "Winter distribution" layers to search only for objects occurring in the selected layers in summertime or in both summer- and wintertime.

To perform a more complex search, click on the Options... button. This will open the Search Options dialog box. Here, you can specify the Boolean search mode, i.e., whether to search for objects occurring in some or all of the selected search squares; in all of the selected squares; or in none of the squares. Check off the "fuzzy search" box and choose the fuzzy search range to perform a "fuzzy" or approximate search, i.e., to extend the search in a range of one, two, or three squares beyond the selected search squares. Click on "Limit search to objects found in the last search" to search only among the objects that were found in the most recent search that you've performed.

Click on Clear Map, then click on Paste... to paste the distribution of an object onto the search map. Squares in deactivated color layers will not be pasted onto the search map. If you've set the search mode (in the Search Options) to "some or all," you can now click on Search >> to find out which

objects partially overlap the distribution of that object.

To search on another map, select it from the Map menu. If you've selected one or more squares on the search map, MapIt will automatically translate the search squares to the new map.

You can also find an object by name, either by clicking on the Contents button and typing the first few letters of its name, or by clicking on the Find button, typing the text string that you want to find in the object names into the Find window, and clicking on Find.

Diversity (taxon richness). To switch to diversity mode, click on the Diversity tab along the bottom of the window. Now you can examine the species/taxon richness — the number of objects that occur in each square on the current map. The legend along the top of the MapIt window tells you what each shade of green signifies; darker shades indicate higher counts, lighter shades indicate low counts. Click on "Range" to change the range (the minimum and maximum objects pr. square shown), or on "Interval" to change the interval (the number of objects pr. square that each shade of green signifies). For greater color detail, change the interval to a lower number.

If you've deactivated one or more color layers using the check boxes in the Legend, those layer(s) will be ignored in the diversity index. You can therefore turn color layers on or off in the Legend to see the diversity index for one ore more specific layers.

The Information window tells you how many objects occur in the grid square underneath the cursor. Click on More Info... to find out more about the diversity index. To export the diversity index to a file, choose Save Text... from the File menu. In the Save dialog box, select Search from the list and click on OK.

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