



KE EMu Documentation

EMu: Taxonomy

Document Version 1

KE EMu Version 3.2



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Taxonomy

The EMu Taxonomy module is for recording the scientific names of species, the relationships between names (synonymies), and details that support the scientific name (citations, type specimens, etc.). A Taxonomy record can contain all of the following and more:

- The scientific name of a species (more than twenty ranks can be completed if required).
- Details about citations.
- Details about authors (of the taxonomic name and of citations).
- Attachments to records of type specimens and other specimens referred to in citations.
- Homotypic and heterotypic synonyms of the name.

When a taxonomist identifies a new species of animal or plant he or she will create a new name for the species. This name is usually published in a scientific journal in which the taxonomist brings supporting evidence, comparisons with other similar species and the reasons that the specimens examined should be considered a new species. You would use the Taxonomy module to:

- Link an organism's record in the Catalogue module to a record of its scientific name (many records in your Catalogue might attach to a single Taxonomy record).
- Record a new scientific name. In this case you would probably link the new Taxonomy record to records of the type specimens in your Catalogue module, citations in the Bibliography module and Author details in the Parties module.

Introduction to Taxonomy

From the Greek *taxis*, meaning arrangement, order, and *nomos*, meaning law, science, Taxonomy is the science, laws and principles of classification. While almost anything can be classified, the EMu Taxonomy module is intended for recording details about the scientific name - the classification - of organisms: plants and animals.

Owing much to the work of Carolus Linnaeus (1707-1778), modern taxonomies of plants and animals are a practical approach to ordering and naming groups of organisms in logical hierarchical structures. The Linnaean system specifies seven major categories for organisms:

- Kingdom
- Phylum in Zoology or Division in Botany
- Class
- Order
- Family
- Genus
- Species



Sub-divisions within these categories, such as subclass and superfamily also exist. In EMu over twenty categories or ranks are available.

Classification entails identifying similarity between organisms as well as evolutionary descent until a point of uniqueness can be identified. Thus many organisms belong to the same kingdom, fewer to the same phylum, fewer still to the same class, and so on. What emerges is a series of parent-child relationships that ends with a species, a unique group of closely related organisms that are able to interbreed and produce fertile offspring.

Categories higher than kingdom (organism and domain) are typically omitted in the standard description of an organism, and in most cases listing the lower level categories (family, genus and species) is sufficient to imply the higher level categories. When recording a scientific name in EMu, Lookup Lists are filtered and fields auto-filled depending on the selection of values in other fields. For instance, selecting `sapiens` in the *Species* field will auto-fill the *Genus* and *Family* fields with `Homo` and `Hominidae` respectively. See *Auto-fill and Lookup List filtering* (page 7) for more details.

The naming of a species is governed by strict rules:

1. The name must be Latin, unique and binomial (a combination of the genus and species names).
2. The name must be published in a well respected, preferably international, scientific journal.
3. The publication must include a description of the new species.

4. The description must be based on a type specimen that is accessible to other scientists.

An EMu Taxonomy record manages all of this detail. Furthermore, different rules apply to the construction of the scientific name of zoological and botanical species and EMu will take user input (genus, species, author name, citations, date, etc.) and generate the appropriate format depending on the rule set specified (ICBN or ICZN).

International Codes: ICBN and ICZN

Rules have been devised for the publication, validation and documentation of scientific names in order to ensure a unique name for every taxon. In defining taxonomic names for organisms, two primary sets of rules apply, depending on whether the species is zoological or botanical:

- International Code of Zoological Nomenclature (ICZN)
- International Code of Botanical Nomenclature (ICBN)

While there are many similarities between the two, there are some important differences. For instance:

- According to the rules of ICZN, when a species is combined with a different genus, the name of the author of this new combination is not included in the scientific name. However, according to the rules of the ICBN the combination authors are included. For example:
 - According to the ICBN the Taxonomic name *Cucumis chrysocomus* Shumacher, (1827) becomes *Rhaphiodiocystis chrysocoma* (Schumacher) C. Jeffrey (1962).
 - According to the ICZN the taxonomic name *Bothynoproctus portai* Straneo, 1941 becomes *Neotalis portai* (Straneo, 1941).
- Tautonyms are allowed in the ICZN but not ICBN (e.g. *Bison (Bison) bison* is an available name according to the ICZN).
- In the ICZN the higher levels of the classification hierarchy are:
Kingdom>Phylum>Subphylum.
- In the ICBN the higher levels of the classification hierarchy are:
Kingdom>Division>Subdivision.

(Reference: *Principles of Phylogenetics*, Integrative Biology 200A, 9 March 2006, University of California, Berkeley)

These rules are encoded in EMu and it is a simple matter to conform to either set by selecting ICBN or ICZN from the *Applicable Code: (Controls)* drop list on the Classification tab:



Either value can be set as the default for an organisation, department, group or user whenever a new record is added.

While most of the differences are not immediately apparent when a rule set is selected, the difference between the zoological and botanical classification hierarchy is evident on the Higher Class. tab:

- The ICBN hierarchy is:

The screenshot shows the 'Taxonomy (1) - New' window. The title bar includes standard window controls and a menu bar with File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. Below the menu bar is a toolbar with various icons. The main area is titled 'Higher Classification' and contains two columns of input fields. The left column includes Series, Section, Subgenus, Genus, Subtribe, Tribe, Subfamily, Family, Superfamily, and Infraorder. The right column includes Suborder, Order, Superorder, Subclass, Class, Superclass, Subdivision, Division, and Kingdom. Each field has a small red 'X' icon to its right. Below these fields is a section for 'Incertae sedis' with a dropdown menu set to 'No' and an 'Authority:' field. At the bottom, there are tabs for Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, Higher Class., and Geog. The status bar at the very bottom indicates 'New Taxon 1 of 2'.

- The ICZN hierarchy is:

The screenshot shows the 'Taxonomy (2) - New' window. The layout is similar to the first window, but the 'Higher Classification' section has different fields. The left column includes Series, Section, Subgenus, Genus, Subtribe, Tribe, Subfamily, Family, Superfamily, and Infraorder. The right column includes Suborder, Order, Superorder, Subclass, Class, Superclass, Subphylum, Phylum, and Kingdom. Each field has a small red 'X' icon to its right. Below these fields is a section for 'Incertae sedis' with a dropdown menu set to 'No' and an 'Authority:' field. At the bottom, there are tabs for Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, Higher Class., and Geog. The status bar at the very bottom indicates 'New Taxon 1 of 1'.

Although less obvious, the differences between the rule sets are apparent when values are entered into a taxonomic record, for instance, in the way that a parenthetic author is handled. See *Recording a Parenthetic Author* (page 69) for details.

Auto-fill and Lookup List filtering

Two standard EMu Lookup List features are worth mentioning here for the assistance they provide when working with Taxonomy records. Two or more Lookup List fields can be linked in EMu in a logical hierarchy, where selection of one value implies another (one or more).

For instance, selecting *sapiens* from the *Species: (Classification)* Lookup List on the Classification tab, automatically completes the *Genus & No: (Classification)* and *Family & No: (Classification)* values:

The screenshot shows the 'Taxonomy (1) - New' window with the 'Classification' tab selected. The 'Family & No:' field is filled with 'Hominidae', 'Genus & No:' with 'Homo', and 'Species:' with 'sapiens'. The 'Subspecies:' field is empty. The 'Hybrid & Parentage' section has 'Hybrid?' set to 'No' and 'Rank:' empty. The 'Cultivar Name' section has 'Cultivar?' set to 'No' and 'Name:' empty. The 'Controls' section has 'Applicable Code:' set to 'ICZN' and 'Rank:' set to 'Species'. The 'Scientific Name' section has 'Automatic?' set to 'Yes' and 'Name:' empty. The 'Currently Accepted Name' section has 'Currently Accepted?' set to 'Yes' and 'Current Name:' empty. The bottom tabs include 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'Higher'. The status bar at the bottom indicates 'New Taxon 1 of 1'.

If we now select the **Higher Class.** tab, we find that not only have these categories been completed, several others have also been auto-filled:

Auto-fill operates by filtering Lookup Lists depending on values entered elsewhere in the Lookup List hierarchy. In the case of *sapiens* in the *Species: (Classification)* Lookup List, only one value is possible in the *Genus & No: (Classification)* and *Family & No: (Classification)* fields. If however, *Homo* were entered in the *Genus & No: (Classification)* field, the *Family & No: (Classification)* field is automatically populated with *Hominidae* but the *Species: (Classification)* field is not completed - there is more than one possible species in the *Hominidae Homo* classification. Nonetheless, the *Species: (Classification)* Lookup List is filtered to only those values which are possible, making selection of the correct value far simpler than searching a massive list:



Lookup Lists are constructed as data is entered into EMu; they can be maintained using the Lookup Lists module.

Taxonomy module: Tabs

In this section we examine the following tabs in detail:

- Classification (page 10)
- Citations (page 22)
- Primary Citations (page 27)
- Authors (page 32)
- Geog. Status (page 37)
- Common Names (page 39)
- Descriptions (page 41)

The remaining tabs:

- Homotypics
- All Synonyms
- Names History
- Pending

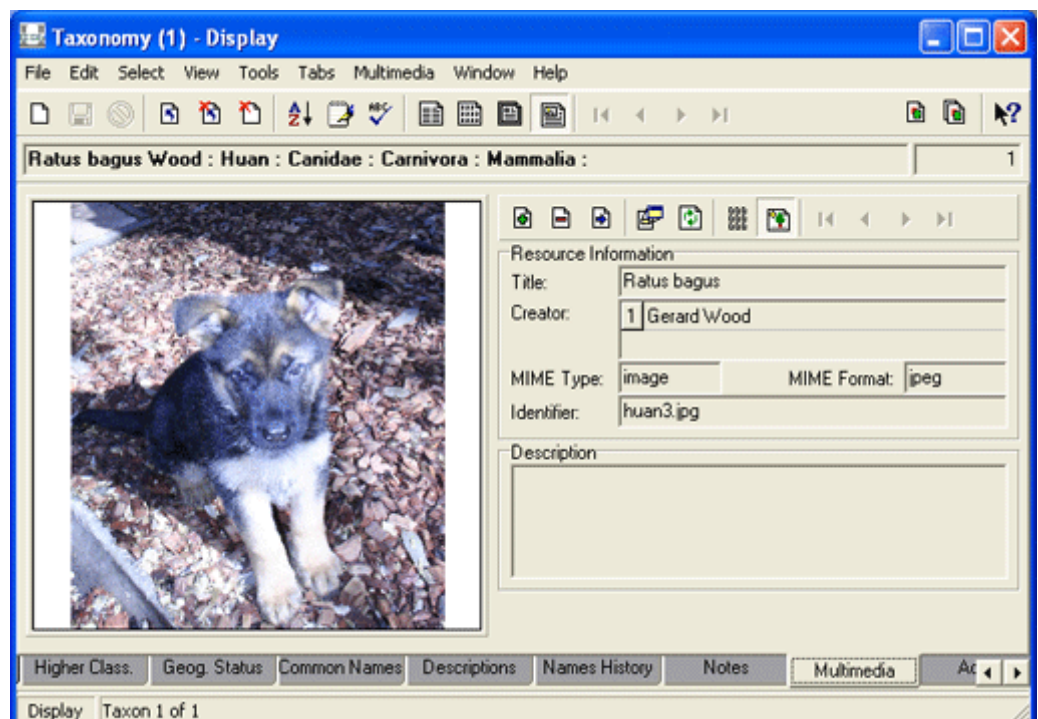
are examined in detail in the sections on Synonymy (page 51).

See also:

- Recording a Parenthetical Author (page 69)



For the purposes of illustration a (fictional!) species with the (un)scientific name of *Ratus bagus* is used:



Classification tab

The Classification tab is the first tab to display when a new record is added to the Taxonomy module:

Typically, there are default values in:

- *Applicable Code:* (Controls)
- *Automatic?:* (Scientific Name)
- *Hybrid?:* (Hybrid & Parentage)
- *Currently Accepted?:* (Currently Accepted Name)



Default values can be set on an organisation, group and user level to reflect the specific requirements of users.

Each group of fields is examined in detail:

- Controls (page 11)
- Classification (page 14)
- Scientific Name (page 16)
- Currently Accepted Name (page 18)
- Hybrid & Parentage (page 19)
- Cultivar Name (page 21)

Controls

Applicable Code: (Controls)

In defining Taxonomic names for organisms, two primary sets of rules apply, depending on whether the name is zoological or botanical:

- International Code of Zoological Nomenclature (ICZN)
- International Code of Botanical Nomenclature (ICBN)

A default value of either ICBN or ICZN is set on the *Applicable Code* control.



See *International Codes: ICBN and ICZN* (page 4) for details about how EMu manages the different rule sets.

In this example the default value in *Applicable Code: (Controls)* is ICBN. To add a Taxonomic record for a zoological species, select ICZN from the *Applicable Code* drop list:

The screenshot shows the 'Taxonomy (1) - New' dialog box. The 'Applicable Code' dropdown menu is open, displaying 'ICBN' and 'ICZN'. A mouse cursor is pointing at 'ICZN'. The dialog box contains various fields for taxonomic data, including 'Classification', 'Hybrid & Parentage', 'Cultivar Name', and 'Controls'. The 'Controls' section includes the 'Applicable Code' dropdown and a 'Rank' field. The 'Scientific Name' section includes 'Automatic?' and 'Name' fields. The 'Currently Accepted Name' section includes 'Currently Accepted?' and 'Current Name' fields. The bottom of the dialog box has tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'Higher'. The 'New' tab is selected, and the status bar shows 'Taxon 1 of 1'.

Rank: (Controls)

When values are entered in the *Classification* group of fields the value of the lowest rank (or category) displays in the *Rank: (Controls)* field. In this example *Ratus bagus* has been entered and *Rank: (Controls)* is automatically populated with *Species*:

The screenshot shows the 'Taxonomy (1) - New' window. The 'Classification' section on the left contains the following fields: 'Family & No:', 'Genus & No:' (containing 'Ratus'), 'Subgenus:', 'Species:' (containing 'bagus'), 'Subspecies:', and 'Other:' (with sub-fields 'Other Ra...' and 'Other Value'). The 'Controls' section on the right shows 'Applicable Code:' set to 'ICZN' and 'Rank:' set to 'Species'. Other sections visible include 'Hybrid & Parentage', 'Cultivar Name', 'Scientific Name', and 'Currently Accepted Name'. The bottom of the window has tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'Higher', with 'Classification' currently selected.

If only *Ratus* had been entered in the *Genus & No: (Classification)* field, *Rank: (Controls)* would be populated with *Genus*, and so on.

Rank: (Controls) is a read-only field that identifies the lowest rank recorded in the Taxonomic hierarchy for the current record and it can be particularly useful when searching. For example, to search for all species in the genus *Rubus*, you would perform the following search:

The screenshot shows the 'Taxonomy (1) - Search' window. The 'Classification' tab is selected. The 'Family' field is empty, 'Genus' is 'Rubus', and 'Rank' is 'species'. The 'Scientific Name' field is empty. The 'Currently Accepted Name' section has 'Current Name' and 'Accepted ?' fields, both empty. The 'Controls' section has 'Rank' set to 'species' and 'Applicable Code' empty. The bottom tabs are 'Classification 1', 'Classification 2', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', and 'Per'.

Keep in mind that *Rank: (Controls)* records the lowest rank in a record:

If we wanted to search for genera for the family *Rosaceae*, we would enter *Rosaceae* in *Family: (Classification)* and *Genus* in *Rank: (Controls)*:

The screenshot shows the 'Taxonomy (1) - Search' window. The 'Classification' tab is selected. The 'Family' field is 'Rosaceae', 'Genus' is empty, and 'Rank' is 'Genus'. The 'Scientific Name' field is empty. The 'Currently Accepted Name' section has 'Current Name' and 'Accepted ?' fields, both empty. The 'Controls' section has 'Rank' set to 'Genus' and 'Applicable Code' empty. The bottom tabs are 'Classification 1', 'Classification 2', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', and 'Per'.

When the search is run, records in which the family is *Rosaceae* and which have a value in the *Genus* rank will be returned, but *Rosaceae Rubus pilostachys* **would not be returned**, as the lowest rank in this record is *Species*.

Classification

In the *Classification* group of fields, enter values in at least the *Genus & No.* and *Species* fields (use Lookup Lists whenever possible):



The *Rank: (Controls)* field (page 11) automatically updates to record the lowest rank specified in the *Classification* fields.

If required, select the **Higher Class.** tab and complete as many of the remaining categories of the Taxonomic hierarchy as necessary:

Taxonomy (1) - New

File Edit Select View Tools Tabs Multimedia Window Help

Higher Classification

Series: Suborder:

Section: Order:

Subgenus: Superorder:

Genus: Subclass:

Subtribe: Class:

Tribe: Superclass:

Subfamily: Subphylum:

Family: Phylum:

Superfamily: Kingdom:

Infraorder:

Incertae sedis: Authority:

Citations Primary Citation Authors Homotypics All Synonyms Pending Higher Class. Geog

New Taxon 1 of 1



Note that when the Higher Class. tab is selected, the *Genus* rank is already completed with the value entered on the Classification tab. Conversely, if a value is entered in the *Family* rank on this tab, it will be filled automatically on the Classification tab:

Taxonomy (1) - New

File Edit Select View Tools Tabs Multimedia Window Help

Classification

Family & No:

Genus & No:

Subgenus:

Species:

Subspecies:

Other:

Seq. Num.:

Hybrid & Parentage

Hybrid? Rank:

Sex: Parent:

Cultivar Name

Cultivar? Name:

Controls

Applicable Code: Rank:

Scientific Name

Automatic? Name:

Currently Accepted Name

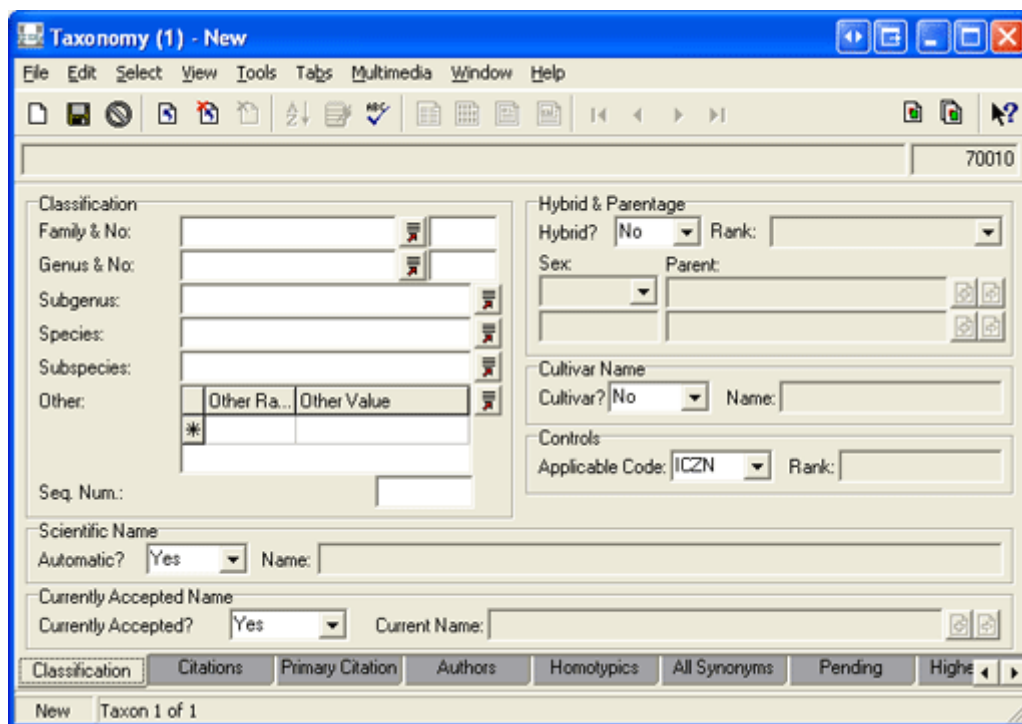
Currently Accepted? Current Name:

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending Higher Class. Geog

New Taxon 1 of 1

Scientific Name

EMu automatically constructs the scientific name of a species when *Automatic?: (Scientific Name)* is set to **Yes**:



The screenshot shows the 'Taxonomy (1) - New' window. The 'Scientific Name' section is highlighted. It contains the following fields and options:

- Classification:** Family & No., Genus & No., Subgenus, Species, Subspecies, Other (with sub-fields for Other Ra... and Other Value).
- Seq. Num.:** A text field.
- Hybrid & Parentage:** Hybrid? (No), Rank: (dropdown), Sex: (dropdown), Parent: (text field).
- Cultivar Name:** Cultivar? (No), Name: (text field).
- Controls:** Applicable Code: (ICZN), Rank: (text field).
- Scientific Name:** Automatic? (Yes), Name: (text field).
- Currently Accepted Name:** Currently Accepted? (Yes), Current Name: (text field).

At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and Higher. The 'New' tab is selected, and it shows 'Taxon 1 of 1'.



Typically the default value for *Automatic?: (Scientific Name)* is **Yes**.

The scientific name is built from a range of values entered in the record and as the record is saved. Values include:

1. The genus and species names.
2. The name of the author of the scientific name.
3. The year of publication of the scientific name.
4. Various other values - whether it is a hybrid (page 19), a combination (page 69), etc.

In this example the name was auto-generated according to the rules of the ICZN:

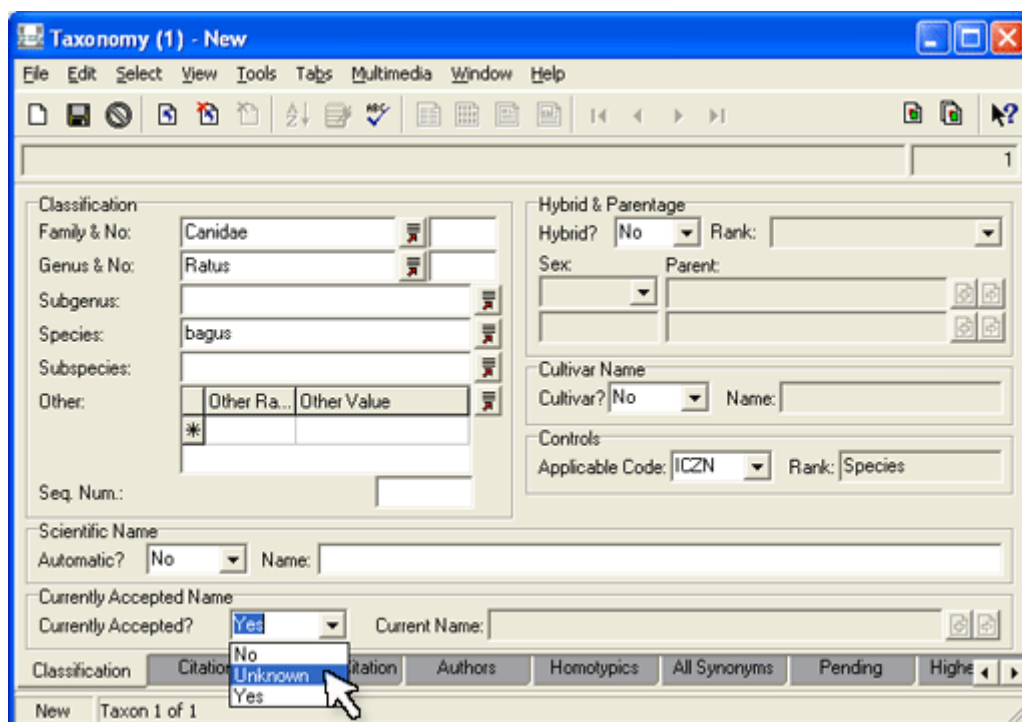


The *Name: (Scientific Name)* field is read-only when **Yes** is selected in the *Automatic?: (Scientific Name)* field.

If **No** is selected from *Automatic?: (Scientific Name)*, the *Name: (Scientific Name)* field becomes available for you to enter or edit a scientific name:

Currently Accepted Name

The *Currently Accepted?: (Currently Accepted Name)* drop list typically has three values:



The screenshot shows the 'Taxonomy (1) - New' window. The 'Classification' section includes fields for Family & No. (Canidae), Genus & No. (Ratus), Subgenus, Species (bagus), Subspecies, and Other (Other Ra... Other Value). The 'Hybrid & Parentage' section includes Hybrid? (No), Rank, Sex, and Parent. The 'Cultivar Name' section includes Cultivar? (No) and Name. The 'Controls' section includes Applicable Code (ICZN) and Rank (Species). The 'Scientific Name' section includes Automatic? (No) and Name. The 'Currently Accepted Name' section includes 'Currently Accepted?' (Yes) and 'Current Name'. The 'Currently Accepted?' dropdown is open, showing options: Yes, No, and Unknown. The 'Classification' tab is selected.



The default value when a record is added is `yes`.

The *Currently Accepted Name* control is used when specifying synonyms of a scientific name. We look at its use in detail in [Synonymy](#) (page 51).

Hybrid & Parentage

A definition of species is a group of closely related organisms that are able to interbreed and produce fertile offspring. The concept of hybrid emerges from the crossing of two or more species. The Liger, for instance, is the offspring of two distinct species: a (male) Lion and (female) Tiger and the Hybrid and Parentage group of fields would be used to record these details.

In this example we record the Taxonomic classification of a Liger (*Panthera leogris*):

1. Complete the Classification details and select **Yes** from the *Hybrid?: (Hybrid & Parentage)* drop list:

The screenshot shows the 'Taxonomy (1) - New' window. The 'Classification' section on the left has the following values: Family & No: Felidae, Genus & No: Panthera, Subgenus: (empty), Species: leogris, Subspecies: (empty), Other: (empty). The 'Hybrid & Parentage' section on the right has: Hybrid? (No), Rank: (empty), Sex: (No), Parent: (empty). The 'Cultivar Name' section has: Cultivar? (No), Name: (empty). The 'Controls' section has: Applicable Code: ICZN, Rank: Species. The 'Scientific Name' section has: Automatic? (Yes), Name: (empty). The 'Currently Accepted Name' section has: Currently Accepted? (Yes), Current Name: (empty). The bottom of the window shows tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and High. The status bar at the bottom says 'New Taxon 1 of 2'.

The remaining *Hybrid & Parentage* fields now become available.

2. In the *Rank: (Hybrid & Parentage)* field, indicate at what Rank hybridisation occurred (in this case at the level of species).
3. It is also possible to record the sex of the parent taxonomies.
 - i. Select **Female** from the *Sex: (Hybrid & Parentage)* drop list and attach *Parent: (Hybrid & Parentage)* to the Taxonomy record for a Tiger (*Panthera tigris*).

- ii. Attach the male parent to the Taxonomy record for a Lion (*Panthera leo*):

Taxonomy (1) - New

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Classification

Family & No: Felidae

Genus & No: Panthera

Subgenus:

Species: leogris

Subspecies:

Other: Other R... Other Value

Seq. Num.:

Hybrid & Parentage

Hybrid? Yes Rank: Species

Sex: Female Parent: Cypraea tigris Linnaeus, 1758 : Cypr.

Male Felis leo Linnaeus, 1758 : Lion : Felis

Cultivar Name

Cultivar? No Name:

Controls

Applicable Code: ICZN Rank: Species

Scientific Name

Automatic? Yes Name:

Currently Accepted Name

Currently Accepted? Yes Current Name:

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending Higher

New Taxon 1 of 2

4. If *Automatic?*: (*Scientific Name*) is set to *Yes*, the Liger's scientific name is generated and displayed in *Name:* (*Scientific Name*) according to the Code selected (ICBN or ICZN) when the record is saved:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

62982

Panthera x leogris : Felidae : Carnivora : Mammalia :

Classification

Family & No: Felidae

Genus & No: Panthera

Subgenus:

Species: leogris

Subspecies:

Other: Other R... Other Value

Seq. Num.:

Hybrid & Parentage

Hybrid? Yes Rank: Species

Sex: Female Parent: Cypraea tigris Linnaeus, 1758 : Cypr.

Male Felis leo Linnaeus, 1758 : Lion : Felis

Cultivar Name

Cultivar? No Name:

Controls

Applicable Code: ICZN Rank: Species

Scientific Name

Automatic? Yes Name: Panthera x leogris

Currently Accepted Name

Currently Accepted? Yes Current Name: Panthera x leogris : Felidae : Carnivora : Mammalia :

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending Higher

Display Taxon 1 of 2

Cultivar Name

This group of fields is relevant in botanical taxonomy. A cultivar is a plant variety produced by cultivation, essentially one that is man-made rather than occurring in the wild. The *Cultivar Name* is a pseudo (unofficial) rank and comes after the scientific name (*genus* and *species*).

To enter a cultivar name:

1. Select **Yes** from the *Cultivar?: (Cultivar Name)* drop list.
The *Name: (Cultivar Name)* field becomes available.
2. Enter the Cultivar name in the *Name: (Cultivar Name)* field.

When the record is saved, the scientific name is generated and displayed in *Name: (Scientific Name)*:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the record is 'Aus bus 'Purple Haze' : : : :'. The window is divided into several sections:

- Classification:** Fields for Family & No., Genus & No. (filled with 'Aus'), Subgenus, Species (filled with 'bus'), Subspecies, and Other (with sub-fields 'Other R...' and 'Other Value').
- Hybrid & Parentage:** Fields for Hybrid? (set to 'No'), Rank, Sex, and Parent.
- Cultivar Name:** Fields for Cultivar? (set to 'Yes') and Name (filled with 'Purple Haze').
- Controls:** Fields for Applicable Code (set to 'ICBN') and Rank (set to 'Species').
- Scientific Name:** A field showing the generated name 'Aus bus 'Purple Haze''.
- Currently Accepted Name:** Fields for Currently Accepted? (set to 'Yes') and Current Name (filled with 'Aus bus 'Purple Haze' : : : :').

At the bottom, there are tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'High'. The status bar at the very bottom shows 'Display Taxon 78504 of 78513'.

Citations tab

The Citations tab is for recording details of written works relating to this scientific name. The most important document to record is the primary citation (in which the scientific name is first defined).

When a scientific name for a species is generated it includes the name of the author of the scientific name (e.g. *Aus yus* Blair, 2002, in which Blair is the name author). In EMu, details about the name author are recorded on the Authors tab. When the name author is the same as the author of the primary citation, details entered on the Citations tab can be automatically shared with the Authors tab. See *Authors tab* (page 32) for details.



Keep in mind however that it is not the purpose of the Citations tab to record the name author's details, but rather to record details about citations.

To demonstrate, we add two citations about the species *Ratus bagus*, the first one (*All about Ratus bagus* by Gerard I. Wood) is the primary citation in which the scientific name (*Ratus bagus*) was first proposed, the other is a supporting document.



In this example it is assumed that there is already a record for each article in the Bibliography module and that the authors' details are recorded in the Parties module.

1. Attach the Bibliography record for *All about Ratus bagus* in the *Cited In:* (Details) field.



Summary data in the *Cited In: (Details)* field includes the author's name.

2. If required, attach the Parties record of the person who verified the article in the *Verified By: (Details)* field and the date the paper was verified in the *Date: (Details)* field.
3. As this is the primary citation for this scientific name, select the **Yes** radio button beside *Primary Citation: (Details)*.

We will be able to use these details when we add the name author's details on the Authors tab (page 32).

The screenshot shows the 'Taxonomy (1) - New' window. The 'Details' section contains fields for 'Cited In:', 'Verified By:', 'Cited Locality:', and 'Remarks:'. The 'Cited In:' field is populated with '[Article] Wood, Gerard. 2005. All About Ratus bagus.'. Below these fields are radio buttons for 'Primary Citation:' with 'Yes' selected. There is also a 'Specimen' field with an asterisk icon. The 'Citations' section at the bottom is a table with columns 'Cited In', 'Verified By', and 'Type Status'. It contains one row with the same citation text as the 'Cited In' field. At the bottom of the window are tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'High'. The 'Citations' tab is currently selected.



Note the *Citations* table at the bottom of the tab. Each row can hold a citations record. The fields are automatically filled as data is entered in the fields above. To view the details for a citation, select its row in the *Citations* table. Details of the currently selected citation display in the fields above.


What next?

- If you have details about the specimens referenced in a citation, in particular type specimens, enter them in the *Specimen* group of fields (page 24).
- If you wish to add another citation (page 26), select the **Asterisk** * in the *Citations* table at the bottom of the tab.
- To add more details about the primary citation, select the **Primary Citation** tab (page 27).

Specimen details


Enter details about any specimens referenced in a citation in the *Specimen* group of fields on the Citations tab.

In this example the taxon described in *All about Ratus bagus* was based on a specimen (the holotype) held by your organisation and recorded in your Catalogue:

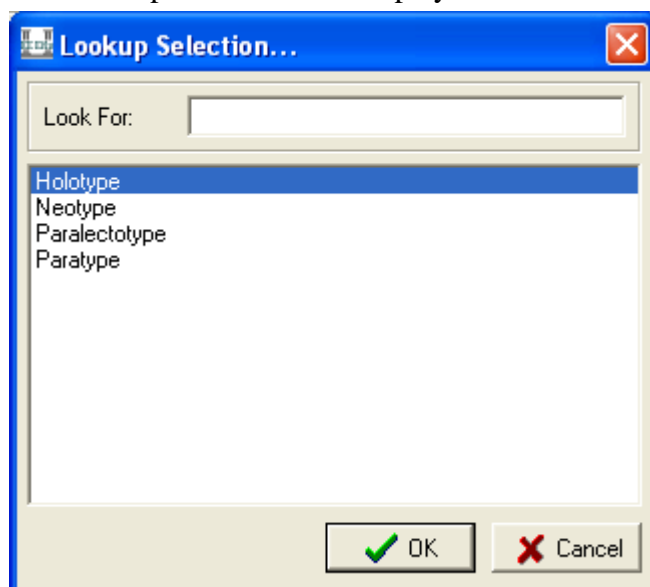
1. With the cursor in the *Specimen* field, select the **Attach**  button beside the *Specimen* table.

The Catalogue module opens.

2. Search for the cited specimen, and attach it.

3. Select the *Type Status* field and then select the **Lookup List**  button.


The Lookup Selection box displays:



This is not a definitive list of types and many more can be listed as required by an organisation.

In this case the specimen is the holotype, so select **Holotype** in the list and then select **OK**.



If other specimens are referenced in the paper, select the **Asterisk**  in the *Specimen* table and repeat these Steps.

The Citations tab displays as:

The screenshot shows a software window titled "Taxonomy (1) - New" with a menu bar (File, Edit, Select, View, Tools, Tabs, Multimedia, Window, Help) and a toolbar. The main area is divided into sections:

- Details:**
 - Cited In: [Article] Wood, Gerard. 2005. All About Ratus bagus.
 - Verified By: [Empty field]
 - Cited Locality: [Empty field]
 - Remarks: [Empty text area]
 - Primary Citation: ☒ Yes ☐ No
- Specimen Table:**


	Specimen	Type Status
1	[A.1096] Africa, 'Bredasdorp, Cape'	Holotype
*		
- Citations Table:**

	Cited In	Verified By	Type Status
1	[Article] Wood, Gerard. 2005. All About Ratus bagus.		Holotype
*			

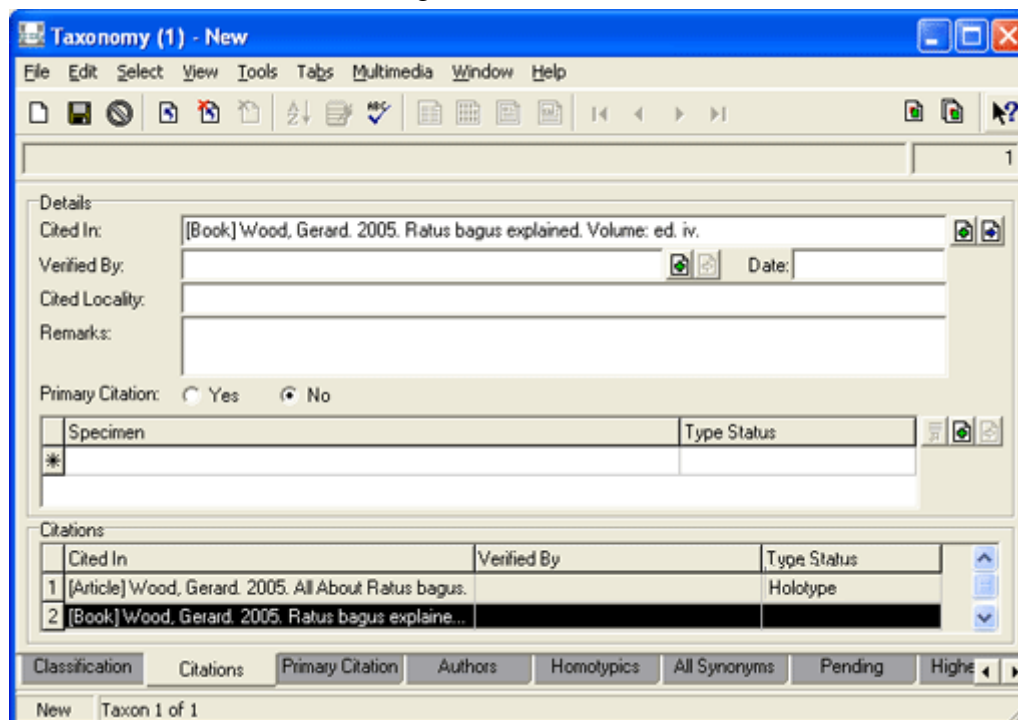
At the bottom, there are tabs: Classification, Citations (selected), Primary Citation, Authors, Homotypics, All Synonyms, Pending, and Higher. The status bar at the very bottom shows "New" and "Taxon 1 of 1".

Add another citation

In this example we want to add another citation:

1. Select the **Asterisk**  in the *Citations* table at the bottom of the tab.
The values in the fields above are cleared and details about the additional citation can be added as demonstrated previously (page 22).

In this case we add the following:



The screenshot shows the 'Taxonomy (1) - New' window. The 'Citations' table at the bottom has two rows:

	Cited In	Verified By	Type Status
1	[Article] Wood, Gerard. 2005. All About Ratus bagus.		Holotype
2	[Book] Wood, Gerard. 2005. Ratus bagus explained. Volume: ed. iv.		

The details for the selected citation (row 2) are shown in the fields above:

Cited In: [Book] Wood, Gerard. 2005. Ratus bagus explained. Volume: ed. iv.
 Verified By:
 Date:
 Cited Locality:
 Remarks:
 Primary Citation: ☐ Yes ☒ No
 Specimen:
 Type Status:



As this is not the primary citation, the **No** radio button beside *Primary Citation* is selected.



To view the details for the first citation listed in the *Citations* table, simply select its row.

Primary Citations tab

The Primary Citations tab is useful for adding additional information about the status of the scientific name as it appears in the primary citation:

There are three groups of fields on the Primary Citation tab:

- *Original Name / Basionym*
- *Status*
- *Link to Type Above Species* (page 30)

Original Name / Basionym

The combination (i.e. the genus and species epithets) by which a species was first described is known as its original name (ICZN) or basionym (ICBN).

If this name (as it is given in the primary citation) is the original name for this species:

1. Select **Yes** from the *Is Original Name?: (Original Name)* drop list.

When the record is saved the scientific name will display in the *Original Name Is: (Original name)* field (which is read-only):

The screenshot shows the 'Taxonomy (1) - Display' window. At the top, a taxonomic path is displayed: 'Ratus bagus : Canidae : Carnivora : Mammalia :'. Below this, the 'Original Name' section contains a dropdown menu for 'Is Original Name?' set to 'Yes'. To its right is a read-only field 'Original Name Is:' containing the same taxonomic path. Below these are several status checkboxes, all set to 'No': 'Illegitimate', 'Invalid', 'Nomen nudum', 'Misspelling', 'Nomen conservandum', and 'Nomen dubium'. At the bottom of the window, there are tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'Higher'. The 'Primary Citation' tab is currently selected.

If the name (as specified in the primary citation) represents a recombination (i.e. the same species epithet with a new genus):

1. Select **No** from the *Is Original Name?: (Original Name)* drop list.
The *Original Name Is* field becomes available.
2. Attach the original scientific name to the *Original Name Is: (Original Name)* field.



The ICBN and ICZN codes specify how scientific names are affected when a name is not the original name. If this is the case, add further details on the Authors tab (page 32).

Status

Six additional pieces of information describing the status of a name can be recorded here. These terms are not comprehensive and are used to capture only some of the information regarding the status of the name. Unfortunately some of these terms vary in meaning between the ICBN and the ICZN.

Term	Description
Illegitimate	<p>An ICBN specific term.</p> <p>A name is illegitimate when:</p> <ul style="list-style-type: none"> It was proposed as a replacement for an earlier name that should have been adopted, or whose epithet should have been adopted (superfluous names). -OR- When the same name had been published earlier for a different taxon (later homonymy).
Invalid	<p>This term has different meanings depending upon which code is in use.</p> <p>For ICBN names, the name did not fulfill all relevant conditions deemed to apply under the ICBN at the time when it was published.</p> <p>For ICZN names, the name is either:</p> <ol style="list-style-type: none"> Objectively invalid (i.e. it is a junior homonym or a junior objective synonym of a potentially valid name). -OR- Subjectively invalid (because it is considered subjectively to be a junior synonym).
Nomen nudum	The name has been published or mentioned without a proper and complete description.
Misspelling	The name has been incorrectly spelled. The term <i>orthographic variant</i> is also used.
Nomen conservandum	The name is (probably) illegitimate or invalid but has been given special status and has been retained for use under the plenary powers of the ICBN or ICZN.
Nomen dubium	<p>A ICZN specific term.</p> <p>The name is of unknown or doubtful application.</p>

Link to Type Above Species

When a new species is proposed it is based on a holotype, a single specimen. This specimen is said to *fix* (or define) the name of the species.

In the same way, in zoological nomenclature, a genus name is *fixed* (defined) by a particular species within the genus. And a family name is *fixed* by a particular genus within the family. The *Link to Type Above Species* fields are used to record this information.

If the lowest rank in the current taxonomic record is species, the *Link to Type Above Species* fields will be greyed out and unavailable:

The screenshot shows a software window titled "Taxonomy (1) - Display". It has a menu bar with "File", "Edit", "Select", "View", "Tools", "Tabs", "Multimedia", "Window", and "Help". Below the menu is a toolbar with various icons. The main content area displays taxonomic information for "Ratus bagus : Canidae : Carnivora : Mammalia :". The "Original Name" section includes a dropdown for "Is Original Name?" set to "Yes" and a text field for "Original Name Is:" containing the same taxonomic path. The "Status" section contains several dropdown menus: "Illegitimate:" (No), "Invalid:" (No), "Nomen nudum:" (No), "Misspelling:" (No), "Nomen conservandum:" (No), and "Nomen dubium:" (No). The "Link to Type Above Species" section has a "Taxon:" dropdown and a "Status:" dropdown, both of which are greyed out. At the bottom, there is a tabbed interface with tabs for "Classification", "Citations", "Primary Citation", "Authors", "Homotypics", "All Synonyms", "Pending", and "Higher". The "Display" tab is active, showing "Taxon 1 of 1".

If the lowest rank is genus, these fields will become available:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus Wood, 2006 : : : 62983

Original Name
Is Original Name? **Yes** Original Name Is: Aus Wood, 2006 : : :


Status
 Illegitimate: **No** Nomen nudum: **No** Nomen conservandum: **No**
 Invalid: **No** Misspelling: **No** Nomen dubium: **No**

Link to Type Above Species
 Taxon:
 Status:

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending High

Display Taxon 1 of 1

In the case of a genus taxon:

1. Select the **Attach**  button beside the *Taxon* field to attach to the type species.
2. Select the Status of the taxon from the *Status* drop list, e.g.:


Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus Wood, 2006 : : : 62983

Original Name
Is Original Name? **Yes** Original Name Is: Aus Wood, 2006 : : :

Status
 Illegitimate: **No** Nomen nudum: **No** Nomen conservandum: **No**
 Invalid: **No** Misspelling: **No** Nomen dubium: **No**

Link to Type Above Species
 Taxon: Aus bus : : : 
 Status: **Type species**

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending High

Display Taxon 1 of 1

Authors tab

The Authors tab records details about the author of the scientific name itself, called here the name author. Most often, although not always, this is the same as the author of the primary citation.

Here we look at two possibilities:

- Primary citation author and name author are the same (page 32)
- Primary citation author and name author are not the same (page 33)



The Authors tab is also used to record *Parenthetic Authors* (page 69) (arising when the species name has been combined with a different genus).

Primary Citation author and Name author are the same

In this example, the author of the primary citation (already entered on the Citations tab (page 44)) is the author of the scientific name:

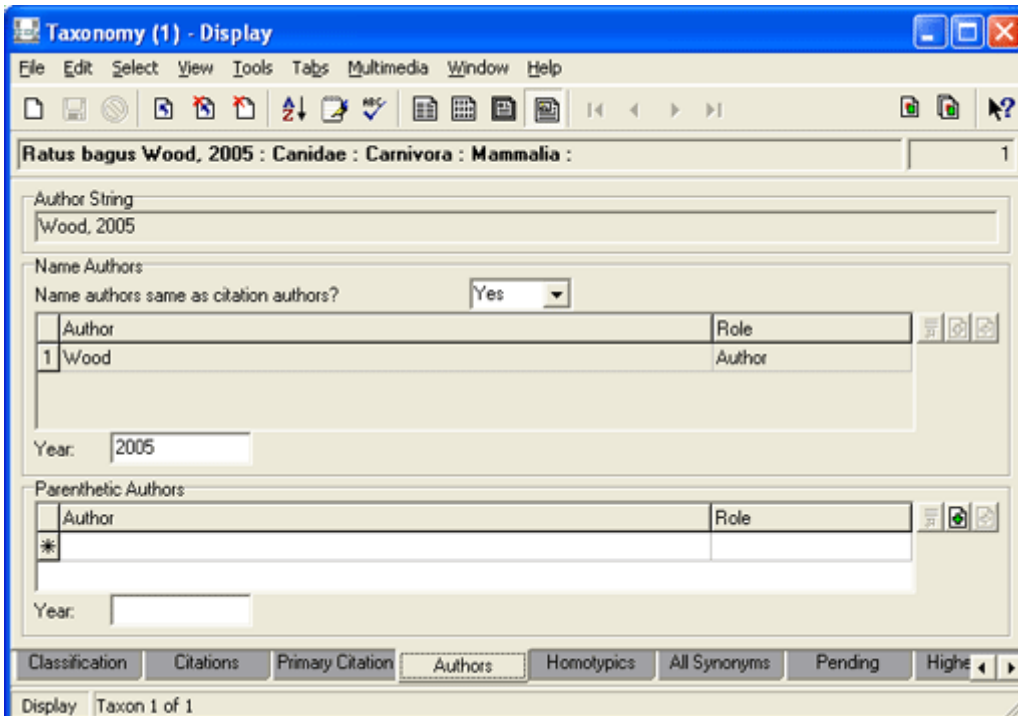
1. Select **Yes** from the *Name authors same as citation authors?* drop list:

The screenshot shows the 'Taxonomy (1) - Edit' window with the 'Authors' tab selected. The 'Name authors same as citation authors?' dropdown is set to 'Yes'. The 'Author' field is populated with an asterisk, and the 'Role' field is set to 'Author'. The 'Year' field is empty.

The name of the author of the primary citation entered on the Citations tab is added to the *Name Authors* table, and the Role is automatically entered as Author.

2. Enter the publication year of the primary citation in the *Year: (Name Authors)* field and save the record.

The scientific name is automatically updated with the new details (displayed in the Summary Data field):



The screenshot shows a software window titled "Taxonomy (1) - Display". The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and navigation. The main content area displays taxonomic information for "Ratus bagus Wood, 2005 : Canidae : Carnivora : Mammalia :". Below this, there are sections for "Author String" (containing "Wood, 2005"), "Name Authors" (with a dropdown set to "Yes"), and "Parenthetic Authors". The "Name Authors" section contains a table with one entry: "1 Wood" as the "Author" and "Author" as the "Role". The "Parenthetic Authors" section is currently empty. At the bottom, there are tabs for "Classification", "Citations", "Primary Citation", "Authors" (which is selected), "Homotypics", "All Synonyms", "Pending", and "High". The status bar at the bottom indicates "Display Taxon 1 of 1".

	Author	Role
1	Wood	Author

	Author	Role
*		



The *Name Authors* fields are read-only when **Yes** is selected from the drop list.

Primary Citation author and Name Author are not the same

If the name author is not the same as the author of the primary citation or you simply wish to add Author details (perhaps you don't have Citation details):

1. Select **No** from the *Name authors same as citation authors?* drop list. The *Name Authors* fields become available.



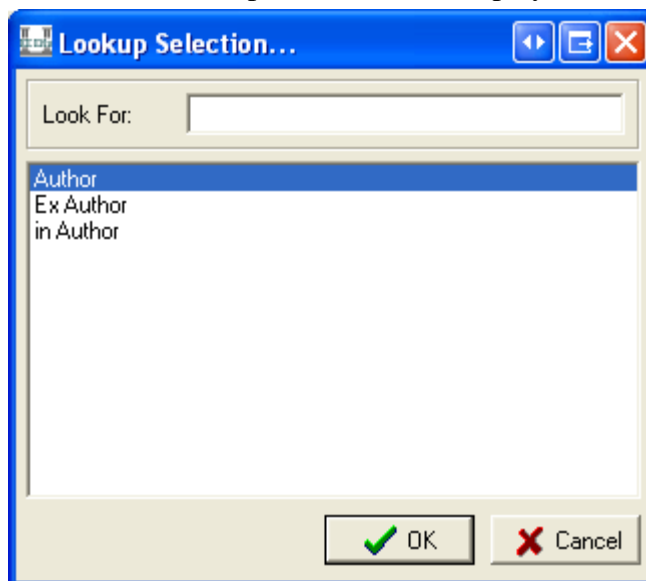
Multiple authors can be added, one per line of the *Name Authors* table by selecting the **Asterisk** in the table.

2. In the row with an , select the cell under *Author: (Name Authors)* and then select the **Attach** button beside the *Name Authors* fields.
The Parties module displays.
3. Search for the Author's Parties record and attach it:

The screenshot shows the 'Taxonomy (1) - Edit' window. The 'Name Authors' section is active, with the dropdown 'Name authors same as citation authors?' set to 'No'. Below this is a table with columns 'Author' and 'Role'. The first row contains '1 Brown' in the 'Author' column. Below the table is a 'Year:' field. To the right of the table are icons for 'Attach', 'Detach', and 'Add'. Below the 'Name Authors' section is a 'Parenthetic Authors' section with a similar table and 'Year:' field. At the bottom, there are tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'Higher'. The 'Authors' tab is currently selected.

4. Select the cell under *Role: (Name Authors)* and then select the **Lookup List** button.

The Author Lookup Selection box displays:



This is not a definitive list of author roles.

Role	Definition
Author	This is the name author who is also the author of the primary citation.
in Author	This role is used when the taxonomic description provided by the author of the name is published in a book or other taxonomic treatment by another author. The second author is referred to as the <i>in Author</i> .
MS Author	Either of these roles is used to identify the author who originally created the name but did not publish a valid description.
Ex Author	



The author role has implications for how the scientific name is generated.

5. Enter the publication year of the scientific name in the *Year: (Name Authors)* field and save the record.

The scientific name is automatically updated with the new details:

The screenshot shows a software window titled "Taxonomy (1) - Display". It has a menu bar with File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. Below the menu is a toolbar with various icons. The main content area displays taxonomic information for "Ratus bagus Brown, 2005 : Canidae : Carnivora : Mammalia :".

Under the "Author String" section, the text "Brown, 2005" is entered. Below this is the "Name Authors" section, which includes a dropdown menu set to "No" for "Name authors same as citation authors?". A table lists authors with columns "Author" and "Role". The first entry is "1 Brown" with the role "Author". There is a "*" icon and an empty row below. A "Year:" field contains "2005".

Below the "Name Authors" section is the "Parenthetic Authors" section, which also has a table with "Author" and "Role" columns. It contains a "*" icon and an empty row. A "Year:" field is present but empty.

At the bottom, there is a tabbed interface with tabs for "Classification", "Citations", "Primary Citation", "Authors" (which is selected), "Homotypics", "All Synonyms", "Pending", and "Higher". The "Display" tab is active, showing "Taxon 1 of 1".

Examples

Both Smith and Brown are *Authors*. This builds as:

Smith & Brown

Smith is an *Author* and Brown is *in Author*. This builds as:

Smith in Brown

Smith is *ex Author* and Brown is *Author*. For ICBN names this builds as:

Smith ex Brown

Geog. Status tab

This tab is for recording details about locations where this species is known to occur.

The tab comprises a single group of fields, *Status Details*, and a multi-value (read-only) table, *List By Geographic Area*. Each row in the table holds details entered in the *Status Details* group of fields:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Ratus bagus Wood : Huan : Canidae : Carnivora : Mammalia : 1

Status Details

Geographic Area: [Homestead (HMSD)] Aellheim Melbourne Eltham Victoria Australia (37 42 S, 145 8 E)

Authority: [Watson, Dr M]

Status: [Endangered (EN)] Status Type: [CITES]

Status Comments:

List By Geographic Area

	Geographic Area	Authority	Status	Status Type	Status Comments
1	[Homestead (HMSD)] Aellheim Melb...	Watson, Dr M	Endangered (EN)	CITES	
2	[Mountain (MT)] Abrupt, Mount Victo...	Brown, Andrew	Endangered (EN)	CITES	
*					



Authors Homotypics All Synonyms Pending Higher Class. Geog. Status Common Names Desc

Display Taxon 1 of 1



Select a row in the *List By Geographic Area* table to display its details in the *Status Details* group of fields.


To record details on the Geog. Status tab:

1. Select the **Attach**  button beside the *Geographic Area: (Status Details)* field.
The Gazetteer module displays. This module records geographical location information for sites / geographical locations and is more general than a Sites record.
2. Search for the location in which the species is found and attach the record.
3. Select the **Attach**  button beside the *Authority: (Status Details)* field.
The Parties module displays. Here we attach the record of the Party who has stated that the species occurs in this geographic location.
4. The *Status: (Status Details)* and *Status Type: (Status Details)* are related. *Status* records the risk of the species in this Geographic Area (e.g. vulnerable, Endangered, etc.). Such classifications can be interpreted differently, and the *Status Type* field specifies which classification system is used for the *Status* selected, e.g. CITES (the Convention on International

Trade in Endangered Species of Wild Fauna and Flora).


- i. Enter a status in the *Status: (Status Details)* field

-OR-

Select a status from the *Status: (Status Details)* Lookup List (select the **Lookup List**  button).

- ii. Enter a status in the *Status Type: (Status Details)* field


-OR-

Select a Status Type from the *Status Type: (Status Details)* Lookup List (select the **Lookup List**  button).

5. Add any additional comments to the *Status Comments: (Status Details)* field.

6. Save the record.

The *List By Geographic Area* table is updated with a summary of the details entered above.

7. To add another location, select the **Asterisk**  in the *List By Geographic Area* table.

A row is added to the table and the fields in the *Status Details* group are cleared, ready for the new values for this geographic location.

Common Names tab

This tab is for recording details about Common and Informal Names for a species.



- A species can have one or more Common Names, and the same Common Name can be used for more than one species! In short, a Common Name is a name by which a species is known that is not the official scientific name.
- An Informal Name is a loose and informal (unofficial) name typically used by taxonomists / scientists to identify one or more organisms before the organisms were officially classified.

The tab comprises two tables:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar includes standard window controls. The menu bar contains: File, Edit, Select, View, Tools, Tabs, Multimedia, Window, Help. The toolbar has icons for file operations, navigation, and editing. The main content area displays taxonomic information for 'Ratus bagus Wood : Huan : Canidae : Carnivora : Mammalia :'. Below this, there are two tables: 'Common Names' and 'Informal Names'. The 'Common Names' table has columns: Common Name, Geographic Lo..., Language, Reference, and Comments. It contains one row with 'Huan', 'Middle Earth', 'Sindarin', '[Book] Tolkien, J R. The Sil...', and ''Common Eldain' f...'. The 'Informal Names' table has columns: Informal Name, Reference, and Comments. It contains one row with 'Hound of Valinor', '[Article] Huan The Hound of Valinor.', and an empty comment field. At the bottom, there are tabs for 'Authors', 'Homotypics', 'All Synonyms', 'Pending', 'Higher Class.', 'Geog. Status', 'Common Names', and 'Desc'. The 'Common Names' tab is selected. The status bar at the bottom shows 'Display Taxon 1 of 1'.

To record details about a Common Name for this species:



1. Enter a name in the *Common Name: (Common Names)* field
-OR-
Select a name from the *Common Names* Lookup List (select the **Lookup List** button).
2. Move to the *Geographic Location: (Common Names)* field and enter the geographical location where this name is used
-OR-
Select a name from the *Geographic Location: (Common Names)* Lookup List (select the **Lookup List** button).
3. Move to the *Language: (Common Names)* field and enter the name's language
-OR-
Select a language from the *Language: (Common Names)* Lookup List (select the **Lookup List** button).

4. Move to the *Reference: (Common Names)* field and select the **Attach**  button.
The Bibliography module displays.
5. Search for and attach the record of a bibliographic reference in which this Common Name is used.
6. Add any comments in the *Comments: (Common Names)* field.
7. To add another Common Name, select the **Asterisk** .



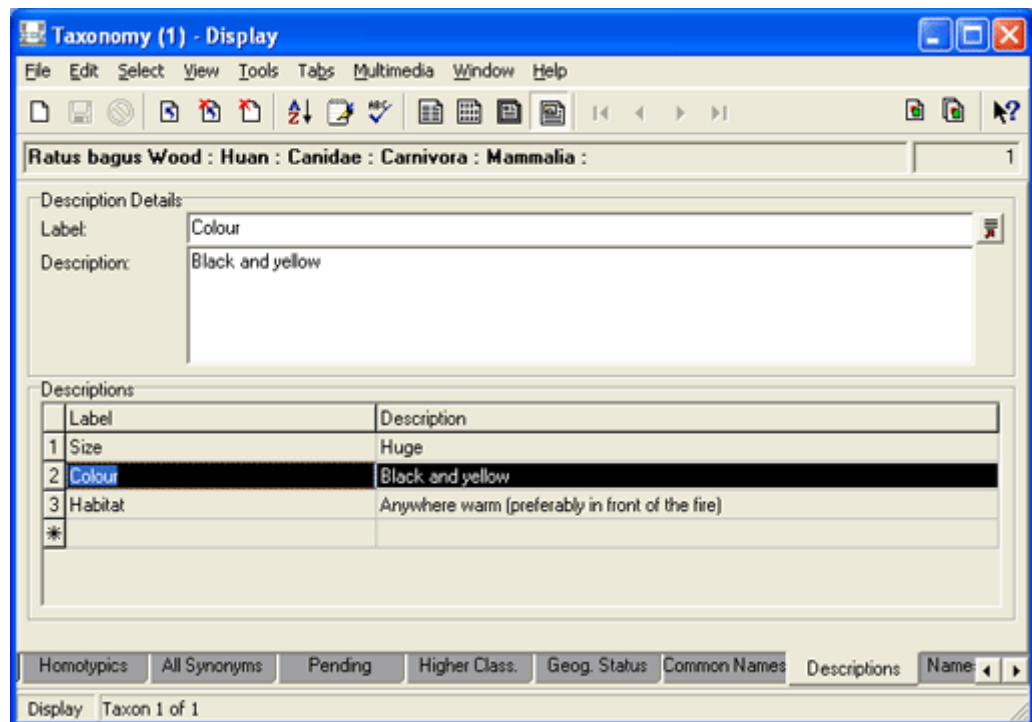
The Common Name displays along with the species' scientific name in the Summary Data.

To record details about an Informal Name for this species:

1. Move to the *Informal Name: (Informal Names)* field and enter an Informal Name.
2. Move to the *Reference: (Informal Names)* field and select the **Attach**  button.
The Bibliography module displays.
3. Search for and attach the record of a bibliographic reference in which this Informal Name is used.
4. Add any comments in the *Comments: (Informal Names)* field.
5. To add another Informal Name, select the **Asterisk** .




Descriptions tab

The Descriptions tab is similar to the Notes tab, except that it allows descriptive content to be labelled. The tab comprises one group of fields, *Description Details*, and a read-only table that lists all added descriptions:



Select a row in the *Descriptions* table to display its details in the *Description Details* group of fields.

To add a description:

1. If there are values in the *Description Details* group of fields (as above), select the row with the **Asterisk** .
This will clear any values from the *Description Details* group of fields.
2. Enter a descriptive label in the *Label:* (*Description Details*) field
-OR-
Select a label from the *Label:* (*Description Details*) Lookup List (select the **Lookup List**  button).
3. Enter a description in the *Description:* (*Description Details*) field.
4. To add another description, select the **Asterisk**  in the *Descriptions* table.

Add a Taxonomy record

In this example we add a Taxonomic record for (zoological) species *Aus bus*. We want EMu to auto-generate the scientific name based on the appropriate set of rules (ICZN in this case).



Only fields relevant to this example are considered. See *Taxonomy module: Tabs* (page 9) for detail about each tab.

To begin:

1. In the Taxonomy module, add a new record.

The module opens in New Screen Mode:

The screenshot shows the 'Taxonomy (1) - New' window. It features a menu bar (File, Edit, Select, View, Tools, Tabs, Multimedia, Window, Help) and a toolbar with icons for file operations and navigation. The main area is divided into several sections:

- Classification:** Fields for Family & No., Genus & No., Subgenus, Species, Subspecies, and Other (with sub-fields for Other Ra... and Other Value).
- Hybrid & Parentage:** Fields for Hybrid? (set to No), Rank, Sex, and Parent.
- Cultivar Name:** Fields for Cultivar? (set to No) and Name.
- Controls:** Fields for Applicable Code (set to ICBN) and Rank (set to Family).
- Scientific Name:** Fields for Automatic? (set to Yes) and Name.
- Currently Accepted Name:** Fields for Currently Accepted? (set to Yes) and Current Name.

At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and Higher. The 'Classification' tab is active. The status bar at the bottom indicates 'New Taxon 1 of 1'.

Note that there are default values in:

- *Applicable Code:* (Controls)
- *Automatic?:* (Scientific Name)
- *Hybrid?:* (Hybrid & Parentage)
- *Currently Accepted?:* (Currently Accepted Name)



Default values can be set on an organisation, group and user level.

Classification tab

On the Classification tab:

1. Select **ICZN** from the *Applicable Code: (Controls)* drop list.
Aus bus is a zoological organism so the ICZN applies.
2. We want EMu to construct the scientific name according to the rules of the ICZN so ensure that *Automatic?: (Scientific Name)* is set to **Yes**.
3. Enter the classification details for this species in the Classification group of fields.

Aus bus is in the family *Demoidae* (add *Demoidae* to *Family & No.*, *Aus* to *Genus & No.*, and *bus* to *Species*).



Note that the *Rank: (Controls)* read-only field automatically updates to indicate the lowest rank in this classification.

4. Save the record.

The scientific name is auto-generated and displays in the *Name: (Scientific Name)* field using the available details:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the record is 'Aus bus : Demoidae :: :'. The window contains several sections:

- Classification:**
 - Family & No.: Demoidae
 - Genus & No.: Aus
 - Subgenus:
 - Species: bus
 - Subspecies:
 - Other: Other R... Other Value
 - Seq. Num.:
- Hybrid & Parentage:**
 - Hybrid?: No
 - Rank: (dropdown)
 - Sex: (dropdown)
 - Parent: (dropdown)
- Cultivar Name:**
 - Cultivar?: No
 - Name: (text field)
- Controls:**
 - Applicable Code: ICZN
 - Rank: Species
- Scientific Name:**
 - Automatic?: Yes
 - Name: Aus bus
- Currently Accepted Name:**
 - Currently Accepted?: Yes
 - Current Name: Aus bus : Demoidae :: :

At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and High. The 'Display' tab is selected, showing 'Taxon 1 of 1'.

Next we complete the Citation details (page 44) and Author details (page 49). The name of the Author of the scientific name (the name author) is included in the scientific name of the species:

- If the author of the primary citation is the same as the name author, you would enter details of the citation on the Citations tab (page 44).
- If not, you would add the name author's details on the Authors tab (page 49).

Citations tab

In this example, the author of the primary citation is the same as the name author. We'll add two citations about the species *Aus bus*:

- The first one (*All about Aus bus* by Gerard I. Wood) is the primary citation in which the scientific name was first proposed.
- The other is a supporting document.



In this example it is assumed that there is a record for each author in the Parties module and for each paper in the Bibliography module and that the Bibliography records are attached to the appropriate Parties record(s). Of course, if they aren't yet recorded, it is always possible to add any necessary records during the Attachment process.

On the **Citations** tab:

1. Enter the title of the paper (*All about Aus bus*) in the *Cited In: (Details)* field and select the **Attach** button

-OR-

Select the **Attach** button, which opens the Bibliography module, search for the paper, and attach it.

The Bibliography record for this paper is attached.




Summary data in the *Cited In: (Details)* field includes the author's name.

2. As this is the primary citation for this scientific name, select the **Yes** radio button beside *Primary Citation*:




Note the *Citations* table at the bottom of the tab. Each row can hold a citation. The fields are automatically filled as data is entered in the *Details* group of fields. To view the details for a citation, select its row in the *Citations* table. Details of the currently selected citation display in the *Details* group of fields.

Enter details about specimens referenced in a citation in the *Specimen* group of fields. In this example the article *All about Aus bus* which first proposes the *Aus bus* name was undertaken on a specimen (the holotype) held by your organisation and recorded in your Catalogue:

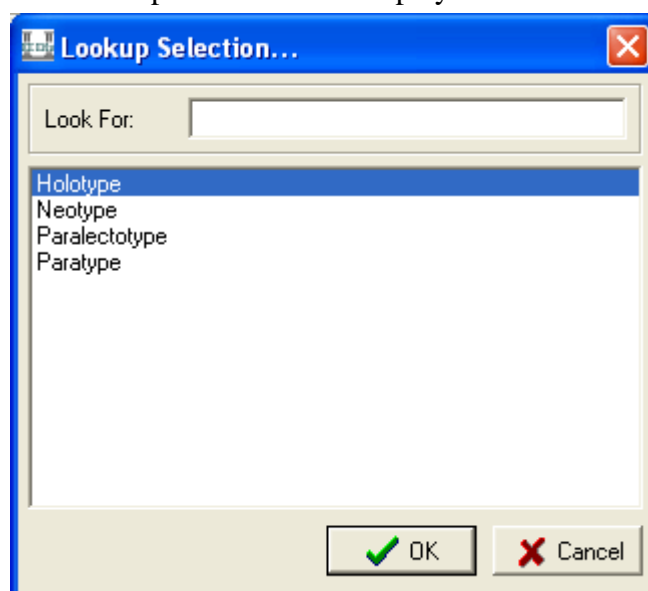
4. With the cursor in the *Specimen* field, select the **Attach**  button beside the *Specimen* table.

The Catalogue module opens.

5. Search for the cited specimen, and attach it.

6. Select the *Type Status* field and then select the **Lookup List**  button.


The Lookup Selection box displays:



This is not a definitive list of types and many more can be listed as required by an organisation.

In this case the specimen is the holotype, so select **Holotype** in the list and then select **OK**.



If other specimens are referenced in the paper, select the **Asterisk**  in the *Specimen* table and repeat Steps 4 onwards.

The Citations tab displays as:


The screenshot shows the 'Taxonomy (1) - Display' window. The title bar is blue. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and navigation. The main content area is divided into several sections:

- Aus bus : Demoidae :: :** (Taxon name and ID 70003)
- Details:**
 - Cited In: [Article] Wood, Gerard. 2005. All about Aus bus.
 - Verified By: (empty field)
 - Cited Locality: (empty field)
 - Remarks: (empty text area)
 - Primary Citation: ☒ Yes ☐ No
- Specimen Table:**

Specimen	Type Status
1 [E.1234/B.2321] Oceania, Australia, Victoria	HOLOTYPE
*	
- Citations Table:**

Cited In	Verified By	Type Status
1 [Article] Wood, Gerard. 2005. All about Aus bus.		HOLOTYPE
*		
- Navigation Tabs:** Classification, Citations (selected), Primary Citation, Authors, Homotypics, All Synonyms, Pending, Higher.
- Footer:** Display Taxon 1 of 1

To add another citation:

7. Select the **Asterisk**  in the *Citations* table at the bottom of the tab.
The values in the fields above are cleared and details about the additional citation can be added as above.

In this case we add the following:

The screenshot shows the 'Taxonomy (1) - Display' window after adding a second citation. The layout is similar to the previous screenshot, but with the following changes:

- Details:**
 - Cited In: [Article] Brown, Andrew. 2006. More about Aus bus.
 - Verified By: (empty field)
 - Cited Locality: (empty field)
 - Remarks: (empty text area)
 - Primary Citation: ☐ Yes ☒ No
- Specimen Table:**

Specimen	Type Status
*	
- Citations Table:**

Cited In	Verified By	Type Status
1 [Article] Wood, Gerard. 2005. All about Aus bus.		HOLOTYPE
2 [Article] Brown, Andrew. 2006. More about Aus bus.		
- Navigation Tabs:** Classification, Citations (selected), Primary Citation, Authors, Homotypics, All Synonyms, Pending, Higher.
- Footer:** Display Taxon 1 of 1



As this second citation is not the primary citation, the **No** radio button beside *Primary Citation* is selected.



To view the details for the first citation in the Citations list, simply select it in the list.

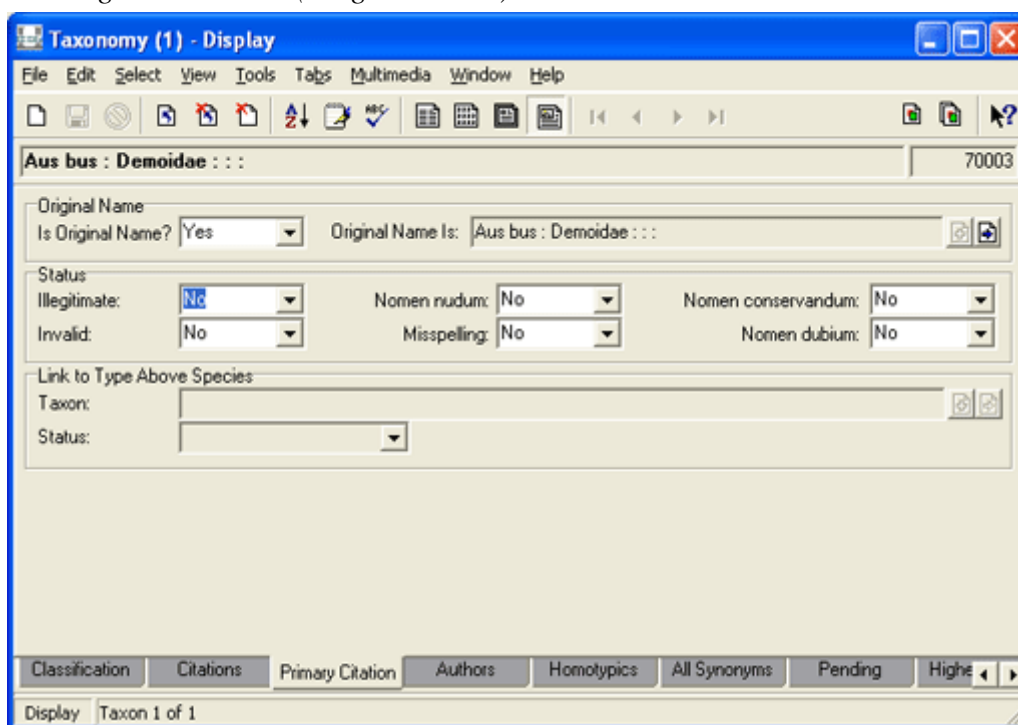
8. Save the record.
9. Next we add more details about the primary citation. Select the **Primary Citation** tab (page 48).

Primary Citation tab

The Primary Citations tab is useful for adding additional information about the status of the scientific name as it appears in the primary citation. In this example, this is the original name of the species:

1. Select **Yes** from the *Is Original Name?: (Original Name)* drop list.
2. Save the record.

Summary data for the scientific name (using the available details) displays in the *Original Name Is: (Original Name)* field:



The screenshot shows a software window titled "Taxonomy (1) - Display". The window has a menu bar (File, Edit, Select, View, Tools, Tabs, Multimedia, Window, Help) and a toolbar with various icons. The main content area displays taxonomic data for "Aus bus : Demoidae : : :". The "Original Name" section shows "Is Original Name?" set to "Yes" and "Original Name Is:" set to "Aus bus : Demoidae : : :". Below this, the "Status" section contains several dropdown menus: "Illegitimate:" (No), "Invalid:" (No), "Nomen nudum:" (No), "Misspelling:" (No), "Nomen conservandum:" (No), and "Nomen dubium:" (No). There is also a "Link to Type Above Species" section with "Taxon:" and "Status:" dropdowns. At the bottom, there are tabs for "Classification", "Citations", "Primary Citation" (which is selected), "Authors", "Homotypics", "All Synonyms", "Pending", and "Higher". The status bar at the bottom indicates "Display Taxon 1 of 1".

3. Next we add details about the name author. Select the **Authors** tab (page 49).

Authors tab

In this example, the name author is the same as the author of the primary citation.

1. Select Yes from the *Name authors same as citation authors?: (Name Authors)* drop list.

The *Name Authors* table updates with the name of the author specified in the primary citation and the *Role* is automatically set to *Author*. The table is read-only when **Yes** is selected.

2. In the *Year: (Name Authors)* field, enter the year in which the scientific name was published.
3. Save the record.

The scientific name, *Aus bus Wood*, 2005 (which is included in the Summary Data field) is auto-generated using the available details:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus bus Wood, 2005 : Demoidae : : : 70003

Author String
Wood, 2005

Name Authors
Name authors same as citation authors? Yes

Author	Role
1 Wood	Author

Year: 2005

Parenthetic Authors

Author	Role
*	

Year:

Classification Citations Primary Citation **Authors** Homotypics All Synonyms Pending High

Display Taxon 1 of 1

The Classification tab displays as:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus bus Wood, 2005 : Demoidae : : : 70003

Classification

Family & No: Demoidae

Genus & No: Aus

Subgenus:

Species: bus

Subspecies:

Other: Other Ra... Other Value

Seq. Num.:

Hybrid & Parentage

Hybrid? No Rank:

Sex: Parent:

Cultivar Name

Cultivar? No Name:

Controls

Applicable Code: ICZN Rank: Species

Scientific Name

Automatic? Yes Name: Aus bus Wood, 2005

Currently Accepted Name

Currently Accepted? Yes Current Name: Aus bus Wood, 2005 : Demoidae : : :

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending High

Display Taxon 1 of 1

Synonymy

The existence of more than one name (synonym) for a taxon is not uncommon and can arise for a number of reasons:

- Due to the re-combination of a name, which we examine in *Recording a Parenthetic Author* (page 69).
- Due to the recognition that two previously published species are actually the same, or that two names actually refer to the same species.

It is this latter case that we deal with here.

The two broad categories of synonymy are Homotypic or Objective and Heterotypic or Subjective:

Synonymy	Description
Homotypic / Objective (page 53)	<p>Two or more synonyms are derived from the same type specimen (the same holotype).</p> <p>Also known as objective or nomenclatural synonyms as the basis for recognising synonymy is empirical (the same type specimen was used to define the species).</p> <p>Example</p> <p>In 1910 Wood identified a new zoological species <i>Gus hus</i> Wood, 1910 and in 1950 Brown identified <i>Jus kus</i> Brown, 1950. In 2004 another scientist realised that Brown had used the same holotype as Wood and that the two names refer to the same species. In this case:</p> <ul style="list-style-type: none"> • The currently accepted name is <i>Gus hus</i> Wood, 1910 as it has priority (it was published first). • The scientific name <i>Jus kus</i> Brown, 1950 would remain exactly as it is as no re-combination (page 69) has taken place, but it would be considered a homotypic synonym of <i>Gus hus</i> Wood, 1910 and would not be a currently accepted name.

Synonymy	Description
Heterotypic / Subjective (page 57)	<p>Two or more synonyms are derived from different type specimens.</p> <p>Also known as subjective or taxonomic synonyms as the basis for recognising synonymy is a matter of opinion.</p> <p>Example</p> <p>In 2002 Wood identified a new zoological species <i>Cus dus</i> Wood, 2002 and in 2003 Brown identified <i>Vus wus</i> Brown, 2003 (using different type specimens). In 2004 another scientist decided that these two names actually refer to the same species. In this case:</p> <ul style="list-style-type: none">• The currently accepted name would be <i>Cus dus</i> Wood, 2002 as it has priority.• <i>Vus wus</i> Brown, 2003 would remain exactly as it is as no re-combination (page 69) has taken place, but it would be considered a heterotypic synonym of <i>Cus dus</i> Wood, 2002 and would not be a currently accepted name.



Where names are synonymous (and by definition interchangeable), only one of the names is identified as the currently accepted name.

Recording a homotypic or objective synonym

Homotypic or objective synonymy occurs when the same holotype was used to define two (or more) scientific names.



A re-combined name (when a species name is combined with a different genus name) is a special case of Homotypic synonymy and is dealt with in *Recording a Parenthetic Author* (page 69).

In the following example:

- Both names were recorded as currently accepted:
In other situations only one or neither name will be recorded as currently accepted. When considering the example below, it is only important to ensure that the scientific name with priority is the currently accepted name.



Where names are in a synonymous relationship, only one can be currently accepted.

- On the Primary Citation tab for each name, *Is Original Name?: (Original Name)* is set to Yes.

This may or may not be the case in practice.



Only the name with priority can be recorded as the Original Name.

Example

- In 1910 Wood identified a new zoological species *Gus hus* Wood, 1910. This was a currently accepted name:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the entry is 'Gus hus Wood, 1910 : : : :'. The interface is divided into several sections:

- Classification:**
 - Family & No: []
 - Genus & No: Gus []
 - Subgenus: []
 - Species: hus []
 - Subspecies: []
 - Other: [] Other R... [] Other Value []
 - Seq. Num: []
- Hybrid & Parentage:**
 - Hybrid? No [] Rank: []
 - Sex: [] Parent: []
- Cultivar Name:**
 - Cultivar? No [] Name: []
- Controls:**
 - Applicable Code: ICZN [] Rank: Species []
- Scientific Name:**
 - Automatic? Yes [] Name: Gus hus Wood, 1910 []
- Currently Accepted Name:**
 - Currently Accepted? Yes [] Current Name: Gus hus Wood, 1910 : : : : []

At the bottom, there are tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'High'. The 'Primary Citation' tab is currently selected. The status bar at the bottom shows 'Display Taxon 1 of 1'.

And is indicated as the original name on the Primary Citation tab (*Is Original Name?: (Original Name)* is set to **Yes**).

- In 1950 Brown identified *Jus kus* Brown, 1950.

This too was a currently accepted name:

The screenshot shows a software window titled "Taxonomy (1) - Display". The main area displays the "Primary Citation" tab for the entry "Jus kus Brown, 1950 : : :". The interface includes several sections:

- Classification:** Fields for Family & No., Genus & No. (Jus), Subgenus, Species (kus), Subspecies, and Other (with sub-fields for Other R... and Other Value).
- Hybrid & Parentage:** Fields for Hybrid? (No), Rank, Sex, and Parent.
- Cultivar Name:** Fields for Cultivar? (No) and Name.
- Controls:** Fields for Applicable Code (ICZN) and Rank (Species).
- Scientific Name:** Fields for Automatic? (Yes) and Name (Jus kus Brown, 1950).
- Currently Accepted Name:** Fields for Currently Accepted? (Yes) and Current Name (Jus kus Brown, 1950 : : :).

 At the bottom, there are tabs for Classification, Citations, Primary Citation (selected), Authors, Homotypics, All Synonyms, Pending, and Higher. The status bar at the bottom indicates "Display Taxon 1 of 2".

And is indicated as the original name on the Primary Citation tab (*Is Original Name?: (Original Name)* is set to **Yes**).

- In 2004 another scientist realised that Brown had used the same holotype as Wood and that the two names refer to the same species. In this case:
 - The currently accepted name would be *Gus hus* Wood, 1910 as it has priority.
 - The scientific name *Jus kus* Brown, 1950 would remain exactly as it is - no re-combination has taken place (page 69) - but it would be considered a homotypic synonym of *Gus hus* Wood, 1910. This will be the junior synonym in this relationship.



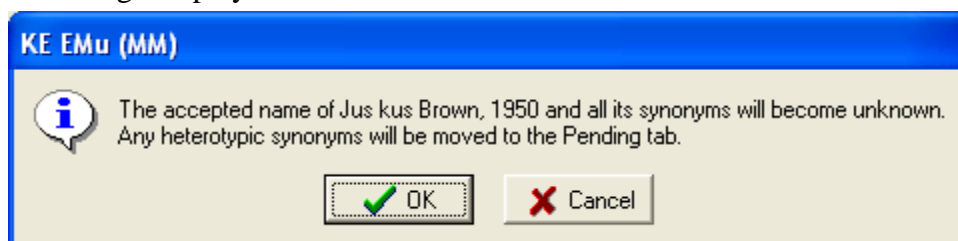
Only one scientific name can be the currently accepted name. It is not possible to create a synonymous relationship between two names that are both currently accepted, and trying to do so will generate a warning message. Therefore:

1. Ensure that the scientific name with priority is the currently accepted name (*Gus hus* Wood, 1910 in this example).

Next ensure that the other scientific name is NOT the currently accepted name (*Jus kus* Wood, 1910 in this example):

2. Select **Unknown** from the *Currently Accepted?: (Currently Accepted Name)* drop list.

A message displays:

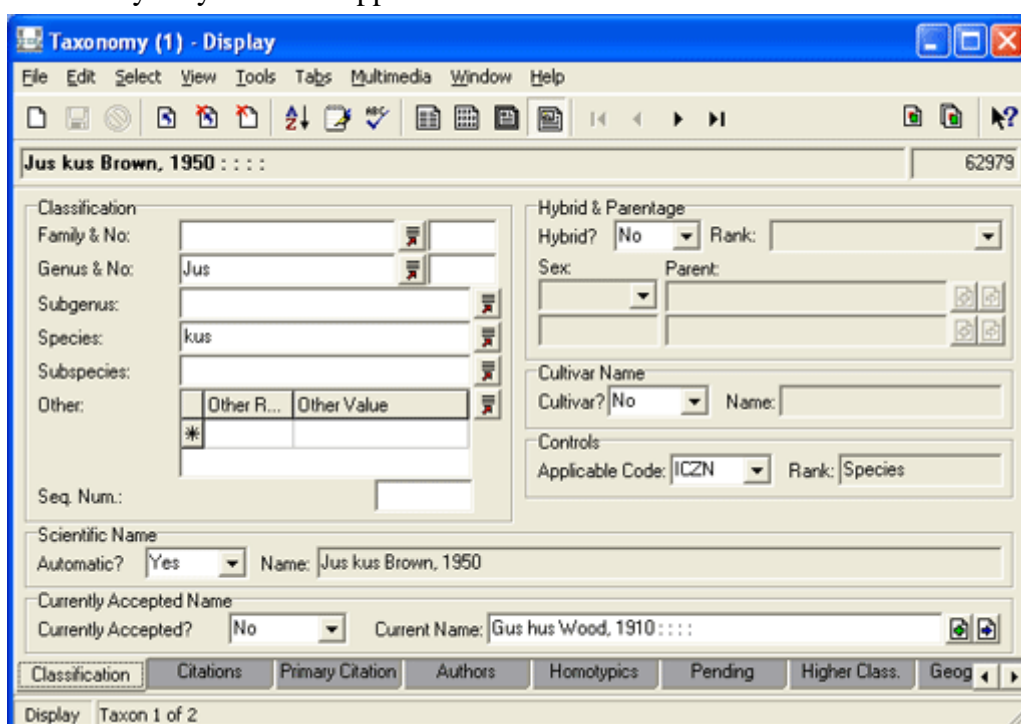


3. Select **OK**.



See *Pending* (page 65) for an explanation of what happens to heterotypic synonyms that are moved to the Pending tab.

The All Synonyms tab disappears from the *Jus kus* record:



Only the record for the currently accepted name has the All Synonyms tab and is able to list all synonyms.

4. Select the **Primary Citation** tab and if *Is Original Name?: (Original Name)* is set to Yes, select **Unknown** from the drop list.

In the record for the currently accepted name (*Gus hus* Wood, 1910 in this example):

5. Select the **Homotypics** tab.
6. Attach the *Jus kus* Brown, 1950 record in the *Name: (Homotypic Names and Combinations)* field.
7. The default under *Combination/Other: (Homotypic Names and Combinations)* is *Combination*. Delete this and replace with *Other*.
8. Save the record.

If we now display the *Jus kus* record, we find that *Currently Accepted?*: (*Currently Accepted Name*) is automatically set to No and that *Current Name:* (*Currently Accepted Name*) points to the *Gus hus* record:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Jus kus Brown, 1950 : : : 62979

Classification
 Family & No.:
 Genus & No.: Jus
 Subgenus:
 Species: kus
 Subspecies:
 Other: Other R... Other Value
 Seq. Num.:

Hybrid & Parentage
 Hybrid? No Rank:
 Sex: Parent:
 Cultivar Name
 Cultivar? No Name:
 Controls
 Applicable Code: ICZN Rank: Species

Scientific Name
 Automatic? Yes Name: Jus kus Brown, 1950

Currently Accepted Name
 Currently Accepted? No Current Name: Gus hus Wood, 1910 : : :

Classification Citations Primary Citation Authors Homotypics Pending Higher Class. Geog

Display Taxon 1 of 1

If we check the All Synonyms tab in *Gus hus* we find that *Jus kus* is added to the Synonyms List and identified as a Homotypic synonym:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Gus hus Wood, 1910 : : : 62978

Details
 Name: Jus kus Brown, 1950 : : :
 Authority:
 Kind of Synonym: Homotypic

Status of Synonymous Relationship
 Later Homonym: No Nomen oblitum: No Superfluous: No
 Misapplied: No Rejected Name: No Uncertain: No

List

	Name	Authority	Kind of Synonym
1	Jus kus Brown, 1950 : : :		Homotypic
*			

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending Higher

Display Taxon 1 of 1

Recording a heterotypic or subjective synonym

Heterotypic or subjective synonymy occurs when different type specimens are used to define two (or more) scientific names.

Example

- In 1910 Wood identified a new zoological species *Gus hus* Wood, 1910. This was a currently accepted name:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the window name. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and navigation. The main content area is divided into several sections:

- Classification:**
 - Family & No: []
 - Genus & No: Gus []
 - Subgenus: []
 - Species: hus []
 - Subspecies: []
 - Other: [] Other R... [] Other Value []
 - Seq. Num.: []
- Hybrid & Parentage:**
 - Hybrid? No [] Rank: []
 - Sex: [] Parent: []
- Cultivar Name:**
 - Cultivar? No [] Name: []
- Controls:**
 - Applicable Code: ICZN [] Rank: Species []
- Scientific Name:**
 - Automatic? Yes [] Name: Gus hus Wood, 1910 []
- Currently Accepted Name:**
 - Currently Accepted? Yes [] Current Name: Gus hus Wood, 1910 : : : []

At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and High. The 'Primary Citation' tab is currently selected. The status bar at the bottom shows 'Display' and 'Taxon 1 of 1'.

And is indicated as the original name on the Primary Citation tab (*Is Original Name?: (Original Name)* is set to Yes).

- In 1950, and using a different type specimen to Wood, Brown identified *Jus kus* Brown, 1950.

This too was a currently accepted name:

The screenshot shows a software window titled "Taxonomy (1) - Display". The main title bar indicates the current taxon is "Jus kus Brown, 1950 : : : :". The interface includes a menu bar (File, Edit, Select, View, Tools, Tabs, Multimedia, Window, Help) and a toolbar with various icons. The main content area is divided into several sections: "Classification" (Family & No., Genus & No.: Jus, Subgenus, Species: kus, Subspecies, Other: Other R..., Other Value), "Hybrid & Parentage" (Hybrid? No, Rank: Species, Sex, Parent), "Cultivar Name" (Cultivar? No, Name), and "Controls" (Applicable Code: ICZN, Rank: Species). Below these sections are fields for "Scientific Name" (Automatic? Yes, Name: Jus kus Brown, 1950) and "Currently Accepted Name" (Currently Accepted? Yes, Current Name: Jus kus Brown, 1950 : : : :). At the bottom, there are tabs for "Classification", "Citations", "Primary Citation", "Authors", "Homotypics", "All Synonyms", "Pending", and "Higher". The "Primary Citation" tab is currently selected, showing "Jus kus Brown, 1950" as the primary citation. The status bar at the bottom indicates "Display Taxon 1 of 2".

And is indicated as the original name on the Primary Citation tab (*Is Original Name?: (Original Name)* is set to **Yes**).

- In 2004 another scientist decided that though the type specimens were different these two names really refer to the same species. In this case:
 - The currently accepted name would be *Gus hus* Wood, 1910 as it has priority.
 - The scientific name *Jus kus* Brown, 1950 would remain exactly as it is - no re-combination has taken place (page 69) - but it would be considered a heterotypic synonym of *Gus hus* Wood, 1910. This will be the junior synonym in this relationship.



Only one scientific name can be the currently accepted name. It is not possible to create a synonymous relationship between two names that are both currently accepted, and trying to do so will generate a warning message. Therefore:


1. In *Jus kus* Brown, 1950 (the Junior synonym in this relationship because *Gus hus* Wood, 1910 was published first) check whether *Is Original Name?: (Original Name)* is set to **Yes**. If so, select **Unknown** from the drop list.
2. On the Classification tab of *Jus kus* Brown, 1950, select **No** from the *Currently Accepted?: (Currently Accepted Name)* drop list.

The *Current Name: (Currently Accepted Name)* field becomes available:

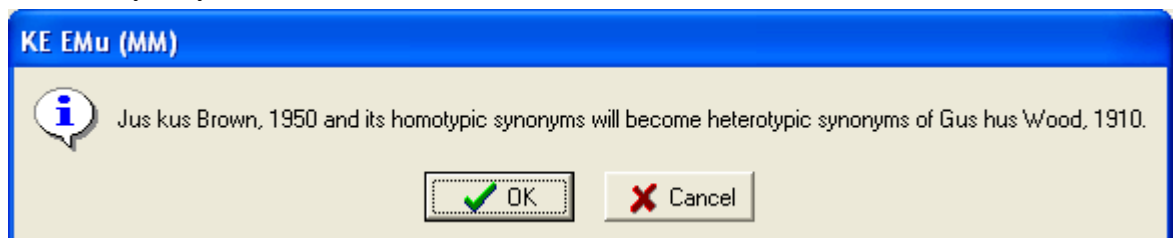
The screenshot shows the 'Taxonomy (2) - Edit' window. The title bar indicates the window is titled 'Taxonomy (2) - Edit'. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and editing. The main area is divided into several sections:

- Classification:** Fields for Family & No., Genus & No. (Jus), Subgenus, Species (kus), Subspecies, and Other (Other R..., Other Value). A 'Seq. Num.' field is also present.
- Hybrid & Parentage:** Fields for Hybrid? (No), Rank, Sex, and Parent.
- Cultivar Name:** Fields for Cultivar? (No) and Name.
- Controls:** Fields for Applicable Code (ICZN) and Rank (Species).
- Scientific Name:** Fields for Automatic? (Yes) and Name (Jus kus Brown, 1950).
- Currently Accepted Name:** Fields for Currently Accepted? (Yes) and Current Name.

At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, Pending, Higher Class., and Geog. The status bar shows 'Edit' and 'Taxon 1 of 1'.

3. Enter *Gus hus* Wood, 1910 in *Current Name: (Currently Accepted name)* and select the **Attach**  button beside the field.

A message displays indicating that *Jus kus* Brown is to become a heterotypic synonym of *Xus bus* Wood:



4. Select **OK** to continue and save the record.

The All Synonyms tab disappears from the *Jus kus* record:



Only the record for the currently accepted name has the All Synonyms tab and is able to list all synonyms.

If we check the All Synonyms tab in *Gus hus* we find that *Jus kus* is added to the Synonyms List and identified as a Heterotypic synonym:

	Name	Authority	Kind of Synonym
1	Jus kus Brown, 1950 : : : '		Heterotypic

Using the All Synonyms tab to record synonyms

An alternative method to record a synonym is to use the All Synonyms tab in the record of the currently accepted name. First ensure that the junior synonym is not recorded as being a currently accepted name (i.e. *Currently Accepted?: (Currently Accepted Name)* should be set to `Unknown` or `No`).

Example

- In 1910 Wood identified a new zoological species which was called *Gus hus* Wood, 1910.

This was a currently accepted name:

And is indicated as the original name on the Primary Citation tab (*Is Original Name?: (Original Name)* is set to `Yes`).

- In 1950, and using a different holotype to Wood, Brown identified *Jus kus* Brown, 1950.


This too was a currently accepted name:

The screenshot shows the 'Taxonomy (1) - Display' window. The main title bar is 'Taxonomy (1) - Display'. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and navigation. The main content area is divided into several sections:

- Classification:**
 - Family & No: []
 - Genus & No: Jus
 - Subgenus: []
 - Species: kus
 - Subspecies: []
 - Other: []
- Hybrid & Parentage:**
 - Hybrid? No Rank: []
 - Sex: [] Parent: []
- Cultivar Name:**
 - Cultivar? No Name: []
- Controls:**
 - Applicable Code: ICZN Rank: Species
- Scientific Name:**
 - Automatic? Yes Name: Jus kus Brown, 1950
- Currently Accepted Name:**
 - Currently Accepted? Yes Current Name: Jus kus Brown, 1950 : : :

At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and Higher. The 'Primary Citation' tab is currently selected. The status bar at the bottom left shows 'Display' and 'Taxon 1 of 2'.

And is indicated as the original name on the Primary Citation tab (*Is Original Name?: (Original Name)* is set to Yes).

- In 2004 another scientist decided that though the type specimens were different these two names really refer to the same species. In this case:
 - The currently accepted name would be *Gus hus* Wood, 1910 as it has priority.
 - The scientific name *Jus kus* Brown, 1950 would remain exactly as it is - no re-combination has taken place (page 69) - but it would be considered a heterotypic synonym of *Gus hus* Wood, 1910. This will be the junior synonym in this relationship.
1. In *Jus kus* Brown, 1950 (the Junior synonym in this relationship because *Gus hus* Wood, 1910 was published first) check whether *Is Original Name?: (Original Name)* is set to Yes. If so, select **Unknown** from the drop list.
 2. On the All Synonyms tab of *Gus hus* Wood, 1910, enter *Jus kus* Brown, 1950 in the *Name: (Details)* field and select the **Attach**  button (or press the TAB key).

Jus kus Brown, 1950 is added to the List and automatically identified as a Heterotypic synonym:

The screenshot shows the 'Taxonomy (1) - Edit' window. The title bar is 'Taxonomy (1) - Edit'. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and editing. The main area is divided into sections: 'Details' with fields for Name (Jus kus Brown, 1950 : : :), Authority, and Kind of Synonym (Heterotypic); 'Status of Synonymous Relationship' with dropdowns for Later Homonym, Misapplied, Nomen oblitum, Rejected Name, Superfluous, and Uncertain; and a 'List' table. The 'List' table has columns for Name, Authority, and Kind of Synonym, and contains one entry: 'Jus kus Brown, 1950 : : :', Heterotypic. At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and Higher Class. The status bar shows 'Edit Taxon 1 of 1'.



If we were recording a homotypic relationship, we'd select Homotypic from the *Kind of Synonym: (Details)* field or we would have added *Jus kus* Brown, 1950 on the Homotypics tab.

If we check the *Jus kus* Brown, 1950 record we find that *Currently Accepted?: (Currently Accepted Name)* is set to No and *Current Name: (Currently Accepted Name)* points to *Gus hus* Wood, 1910:

The screenshot shows the 'Taxonomy (2) - Display' window. The title bar is 'Taxonomy (2) - Display'. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and editing. The main area is divided into sections: 'Classification' with fields for Family & No., Genus & No. (Jus), Subgenus, Species (kus), Subspecies, and Other; 'Hybrid & Parentage' with fields for Hybrid? (No), Rank, Sex, and Parent; 'Cultivar Name' with fields for Cultivar? (No) and Name; 'Controls' with fields for Applicable Code (ICZN) and Rank (Species); 'Scientific Name' with fields for Automatic? (Yes) and Name (Jus kus Brown, 1950); and 'Currently Accepted Name' with fields for Currently Accepted? (No) and Current Name (Gus hus Wood, 1910 : : :). At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, Pending, Higher Class, and Geog. The status bar shows 'Display Taxon 1 of 1'.

Names History tab

The Names History tab provides an audit trail of changes to the synonymy of the name. For instance, if *Aus bus* was a homotypic synonym of *Xus yus*, and then became an accepted name in its own right, the Names History tab would display as:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus bus Chirac, 2003 : Demoidae : : : 9000003

Synonym Details

Name:

Authority:

Kind of Synonym: Date Removed:

Status of Synonymous Relationship

Later Homonym: Nomen oblitum: Superfluous:

Misapplied: Rejected Name: Uncertain:

Previous Synonyms

Name	Date Removed
* <input type="text"/>	<input type="text"/>

Previous Accepted Names

Name	Date Removed
1 Xus yus Bush, 2001 : Demoidae : : :	25/09/2006

Pending Higher Class. Geog. Status Common Names Descriptions **Names History** Notes Mult

Display Taxon 2 of 2



This is a read-only tab and cannot be edited: it updates automatically however as the name changes.

Pending tab

The Pending tab contains a read-only list of former, but currently *unassigned* synonyms of the current name. Typically it only appears in the Taxonomy module when one or more names is listed on it. A synonym of the current name can become *unassigned* when the current name is itself made a synonym of another name.

To understand the convenience of the Pending tab, consider this scenario:

Aus bus is a currently accepted name for a species. It has two synonyms:

- *Aus cus* - a homotypic synonym (page 51).
- *Aus dus* - a heterotypic synonym (page 52).

Suppose there is a change of thinking and *Aus bus* itself becomes a synonym of *Xus yus* (*Xus yus* is now the currently accepted name of the species):

- *Aus bus*'s homotypic (and objective) synonym, *Aus cus*, automatically becomes a synonym of *Xus yus*.
- But what to do with the heterotypic synonym, *Aus dus*? It can no longer be a synonym of *Aus bus* (which is no longer an accepted name) but as a heterotypic (and subjective) synonym it is not necessarily also a synonym of *Xus yus*.

If *Aus dus* is not made a synonym of *Xus yus*, it will instead be listed on *Aus bus*'s Pending tab as a convenient reminder that its former synonym has not been:

- Assigned to *Xus yus*
- OR-
- Made a currently accepted name in its own right.



As soon as *Aus dus* is made currently accepted in its own right or becomes a synonym of another name, it is removed from *Aus bus*'s Pending tab.

Example

Aus bus is a currently accepted name with two synonyms:

Taxonomy (1) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus bus Chirac, 2003 : Demoidae : : : 9000003

Details:

Name: *Aus cus Merkel, 2003 : Demoidae : : :*

Authority:

Kind of Synonym: Homotypic

Status of Synonymous Relationship

Later Homonym: No Nomen oblitum: No Superfluous: No

Misapplied: No Rejected Name: No Uncertain: No

List

	Name	Authority	Kind of Synonym
1	<i>Aus cus Merkel, 2003 : Demoidae : : :</i>		Homotypic
2	<i>Aus dus Wood, 2002 : : :</i>		Heterotypic
*			

Classification Citations Primary Citation Authors Homotypics All Synonyms Pending Higher

Display Taxon 78506 of 78516

If we check the *Aus cus* record we see that it points to *Aus bus* as the currently accepted name:

Taxonomy (2) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus cus Merkel, 2003 : Demoidae : : : 9000004

Classification

Family & No: Demoidae

Genus & No: Aus

Subgenus:

Species: cus

Subspecies:

Other: Other R... Other Value

Seq. Num.:

Hybrid & Parentage

Hybrid? Rank:

Sex: Parent:

Cultivar Name

Cultivar? Name:

Controls

Applicable Code: ICZN Rank: Species

Scientific Name

Automatic? Yes Name: *Aus cus Merkel, 2003*

Currently Accepted Name

Currently Accepted? No Current Name: *Aus bus Chirac, 2003 : Demoidae : : :*

Classification Citations Primary Citation Authors Homotypics Pending Higher Class. Geog

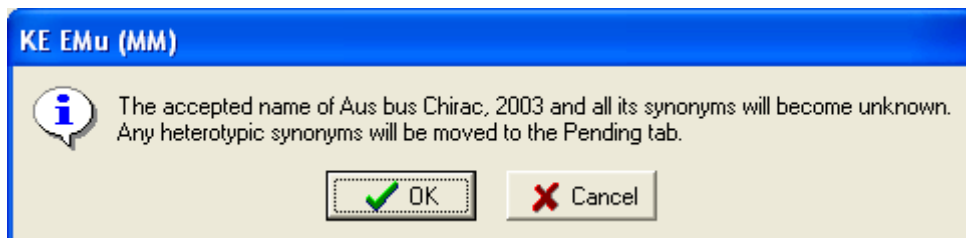
Display Taxon 1 of 2

Later, *Aus bus* itself becomes a synonym of *Xus yus* (in this case a homotypic synonym):

1. On the Classification tab of *Aus bus*, select **Unknown** from the *Currently*

Accepted?: (Currently Accepted Name) drop list.

A message displays indicating that *Aus bus* and all its synonyms will become unknown (no longer currently accepted names) and any heterotypic synonyms will be moved to its Pending tab:



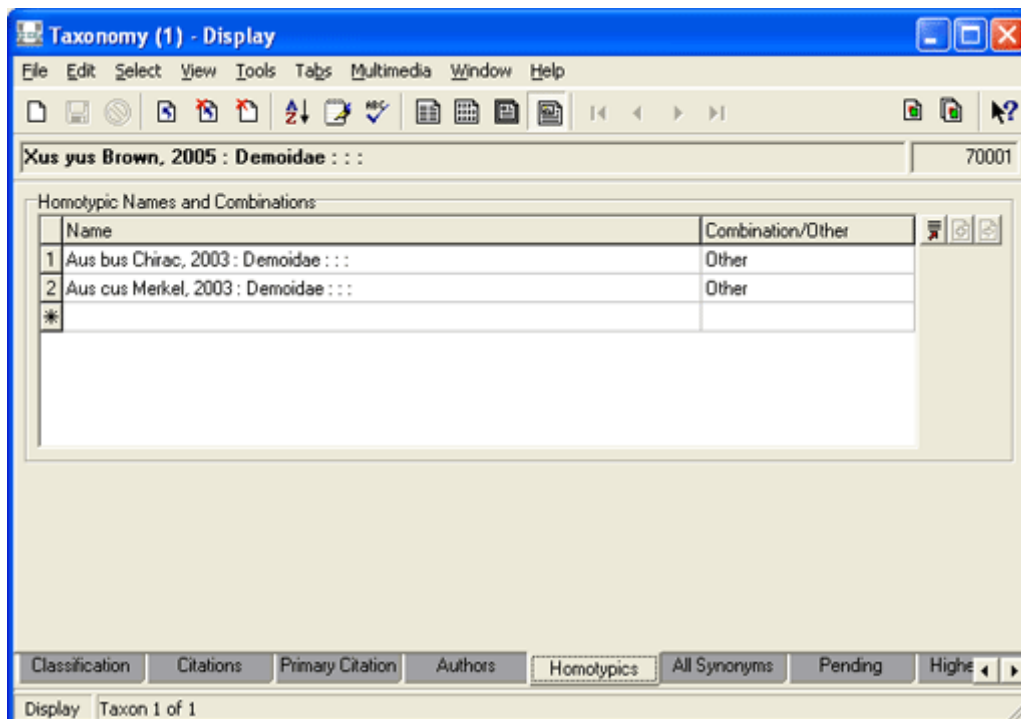
An alternative method is to select **No** from the *Currently Accepted?: (Currently Accepted Name)* drop list and attach the *Xus yus* record at *Current Name: (Currently Accepted Name)*.

2. Select **OK**.
3. Save the record.
4. On the Homotypics tab of *Xus yus*, enter *Aus bus* in the *Name: (Homotypic Names and Combinations)* field and press the TAB key.



If *Aus bus* was a heterotypic synonym of *Xus yus* you'd add it to the All Synonyms tab in *Xus yus*.

Both *Aus bus* and its homotypic synonym *Aus cus* are added to the Homotypics list (by default they are identified as *Combinations* in the *Combination/Other* field. Change this to *Other*):



As we'd expect, if we check the *Aus bus* and *Aus cus* records, both now point to *Xus yus* as the current name:

Taxonomy (2) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus bus Chirac, 2003 : Demoidae : : : 9000003

Classification
 Family & No: Demoidae
 Genus & No: Aus
 Subgenus:
 Species: bus
 Subspecies:
 Other: Other R... Other Value
 Seq. Num.:

Hybrid & Parentage
 Hybrid? No Rank:
 Sex: Parent:
 Cultivar Name
 Cultivar? Name:
 Controls
 Applicable Code: ICZN Rank: Species

Scientific Name
 Automatic? Yes Name: Aus bus Chirac, 2003
 Currently Accepted Name
 Currently Accepted? No Current Name: Xus yus Brown, 2005 : Demoidae : : :

Classification Citations Primary Citation Authors Homotypics Pending Higher Class. Geog

Display Taxon 1 of 2

Which leaves us with the issue of *Aus bus*'s former heterotypic synonym, *Aus dus*. If we select the Pending tab in the *Aus bus* record we find *Aus dus* listed:

Taxonomy (2) - Display

File Edit Select View Tools Tabs Multimedia Window Help

Aus bus Chirac, 2003 : Demoidae : : : 9000003

Details
 Name: Aus dus Wood, 2002 : : :
 Authority:

Status of Synonymous Relationship
 Later Homonym: Nomen oblitum: Superfluous:
 Misapplied: Rejected Name: Uncertain:

List
 1 Aus dus Wood, 2002 : : :
 *

Classification Citations Primary Citation Authors Homotypics Pending Higher Class. Geog

Display Taxon 1 of 2

When *Aus dus* is either made currently accepted in its own right or becomes a synonym of another name, it is removed from *Aus bus*'s Pending tab.

Recording a Parenthetic Author

In these two scientific names:

- *Xus bus* (Brown) Wood - which is formulated according to the rules of the ICBN
- *Xus bus* (Brown 2002) - which is formulated according to the rules of the ICZN

the name in parentheses (Brown) is the author of the original species name. This bracketed name - the parenthetic author - comes about when the species epithet in a scientific name is combined with a different genus. This is a specialised form of synonymisation.

Example

In 2002 Brown wrote a paper identifying a new zoological species, *Aus bus*. The scientific name is:

Aus bus Brown, 2002.

In 2004 Wood publishes a paper that argues that while the species is valid it belongs in a different genus, *Xus*. According to the rules of the ICZN, the new scientific name is:

Xus bus (Brown, 2002)

The use of parentheses indicate that the species *bus* was not originally described in the genus *Xus* and acknowledges the author of the original name.

Botanists take this a bit further and include the author who moved the name (but not the dates). According to the rules of the ICBN, the original scientific name would be:

Aus bus Brown

and the re-combined scientific name would be:

Xus bus (Brown) Wood

Technically, *Aus bus* and *Xus bus* are synonyms (and they are recognised as synonyms in EMu as we'll see when we check the Homotypics tab) but it is more important to identify them as combinations, hence the inclusion of the name of the original name author in parentheses.

Example: Parenthetic Author

In 2002 Brown published a paper identifying a new botanical species, *Aus bus* Brown:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the record is 'Aus bus Brown' with a taxon number of 62976. The interface includes a menu bar (File, Edit, Select, View, Tools, Tabs, Multimedia, Window, Help) and a toolbar with various icons. The main area is divided into several sections:

- Classification:** Fields for Family & No., Genus & No. (filled with 'Aus'), Subgenus, Species (filled with 'bus'), Subspecies, and Other (with sub-fields 'Other R...' and 'Other Value'). A 'Seq. Num.' field is also present.
- Hybrid & Parentage:** Fields for Hybrid? (set to 'No'), Rank, Sex, and Parent.
- Cultivar Name:** Fields for Cultivar? (set to 'No') and Name.
- Controls:** Fields for Applicable Code (set to 'ICBN') and Rank (set to 'Species').
- Scientific Name:** Fields for Automatic? (set to 'Yes') and Name (filled with 'Aus bus Brown').
- Currently Accepted Name:** Fields for Currently Accepted? (set to 'Yes') and Current Name (filled with 'Aus bus Brown : : :').

At the bottom, there are tabs for 'Classification', 'Citations', 'Primary Citation', 'Authors', 'Homotypics', 'All Synonyms', 'Pending', and 'Higher'. The 'Classification' tab is currently selected, and the status bar at the bottom shows 'Display Taxon 1 of 1'.

In 2004 Wood publishes a paper that argues that while the species is valid it belongs in a different genus, *Xus*.

1. First we add a record for *Xus bus*:
 - Add the genus and species.
 - Set *Currently Accepted?: (Currently Accepted Name)* to *yes*.
 - Record the Citation on the Citations tab and set the *Primary Citation: (Details)* option to *yes*.

- Set *Name authors same as citation authors?: (Name Authors)* on the Authors tab to Yes:


The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the record is 'Xus bus Wood : : : :'. The 'Classification' tab is active, showing fields for Family & No., Genus & No. (Xus), Subgenus, Species (bus), Subspecies, and Other. The 'Scientific Name' section shows 'Automatic?' set to 'Yes' and 'Name' as 'Xus bus Wood'. The 'Currently Accepted Name' section shows 'Currently Accepted?' set to 'Yes' and 'Current Name' as 'Xus bus Wood : : : :'. The bottom tabs include Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and Higher Class.

When a scientific name is re-combined it is necessary to identify the currently accepted name and to associate the synonymous names in order to maintain a complete name history.

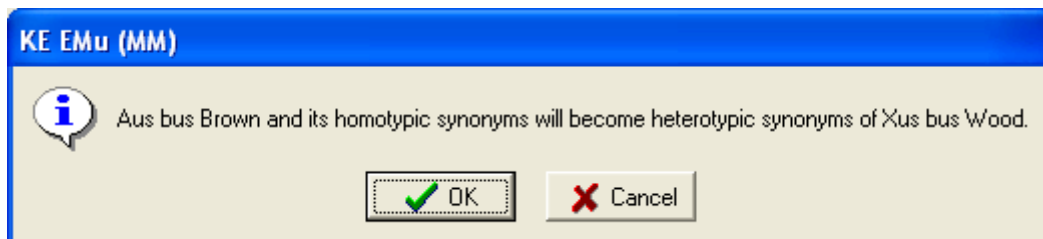
2. Search for the *Aus bus* record.
3. Select **No** from *Currently Accepted? (Currently Accepted Name)* on the Classification tab.

The *Current Name: (Currently Accepted Name)* field becomes available:

The screenshot shows the 'Taxonomy (1) - Edit' window. The title bar indicates the record is 'Aus bus Brown : : : :'. The 'Classification' tab is active, showing fields for Family & No., Genus & No. (Aus), Subgenus, Species (bus), Subspecies, and Other. The 'Scientific Name' section shows 'Automatic?' set to 'Yes' and 'Name' as 'Aus bus Brown'. The 'Currently Accepted Name' section shows 'Currently Accepted?' set to 'No', making the 'Current Name' field available and empty. The bottom tabs include Classification, Citations, Primary Citation, Authors, Homotypics, Pending, Higher Class., and Geog.

- Enter *Xus bus* in *Current Name: (Currently Accepted name)* and select the **Attach**  button beside the field.

A message displays indicating that *Aus bus* Brown is to become a heterotypic synonym of *Xus bus* Wood:



- Select **OK** to continue.



Aus bus is actually a homotypic synonym of *Xus bus*, but for the moment EMu first registers that there is a synonymous relationship between the two names. We make it a homotypic synonym from Step 8 onwards.

The current name for *Aus bus* Brown is now indicated as *Xus bus* Wood.

- Save the record:

- In the *Xus bus* record, select the **Primary Citations** tab.
- Select **No** from the *Is Basionym?: (Basionym)* drop list.

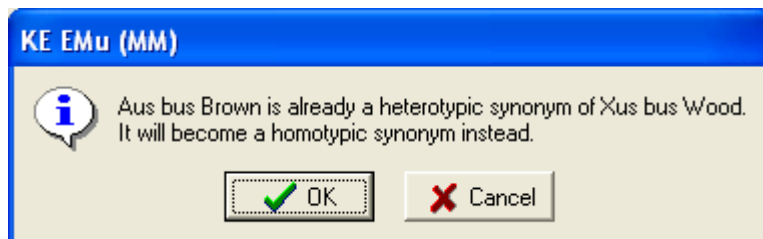


In Zoology, you would select from the *Is Original Name?: (Original Name)* drop list.

The *Basionym Is: (Basionym)* field becomes available.

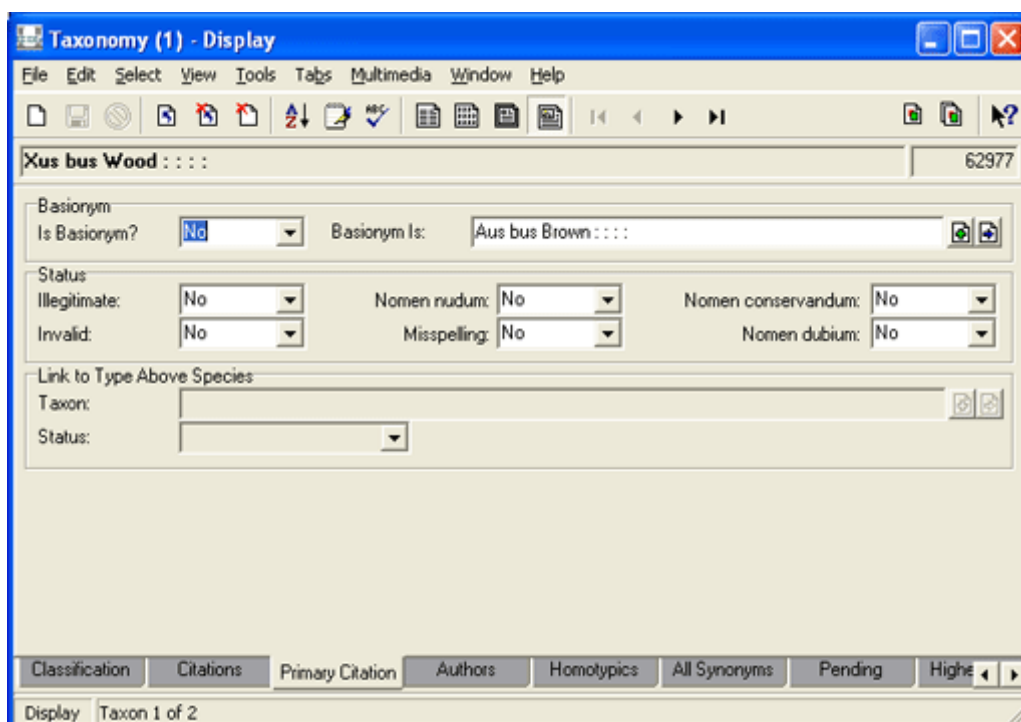
- Enter *Aus bus* in *Basionym Is: (Basionym)* and select the **Attach**  button.

A message displays indicating that *Aus bus* Brown will become a homotypic synonym of *Xus bus* Wood:



10. Select **OK** to continue.

11. Save the record:



12. Select the **Authors** Tab:

The screenshot shows the 'Taxonomy (1) - Display' window. The 'Authors' tab is selected at the bottom. The window displays the following information:

- Author String:** Wood
- Name Authors:** Name authors same as citation authors? Yes
- Table:**

	Author	Role
1	Wood	Author
- Year:** 2004
- Parenthetic Authors:**

	Author	Role
*		
- Year:** (empty field)
- Navigation tabs:** Classification, Citations, Primary Citation, **Authors**, Homotypics, All Synonyms, Pending, Higher
- Status:** Display Taxon 1 of 2

Wood is listed as the name author for *Xus bus* but we need to acknowledge that Brown is the original author of the species name.

13. Attach the Parties record for Brown in the *Authors: (Parenthetic Author)* field.
14. Select **Author** from the *Role: (Parenthetic Author)* Lookup List.
15. In the *Year: (Parenthetic Authors)* field enter the year in which the original scientific name (*Aus bus*) was published.
16. Save the record.

The scientific name is generated using the parenthetic author name according to the rules of ICBN:

The screenshot shows the 'Taxonomy (1) - Display' window. The title bar indicates the window name and standard OS controls. The menu bar includes File, Edit, Select, View, Tools, Tabs, Multimedia, Window, and Help. The toolbar contains various icons for file operations and navigation. The main content area is divided into several sections:

- Classification:**
 - Family & No: [Empty field]
 - Genus & No: *Xus*
 - Subgenus: [Empty field]
 - Species: *bus*
 - Subspecies: [Empty field]
 - Other: [Other R... Other Value]
 - Seq. Num.: [Empty field]
- Hybrid & Parentage:**
 - Hybrid? ☐ No Rank: [Dropdown menu]
 - Sex: [Dropdown menu] Parent: [Dropdown menu]
- Cultivar Name:**
 - Cultivar? ☐ No Name: [Empty field]
- Controls:**
 - Applicable Code: ☐ ICBN Rank: ☐ Species
- Scientific Name:**
 - Automatic? ☒ Yes Name: *Xus bus (Brown) Wood*
- Currently Accepted Name:**
 - Currently Accepted? ☒ Yes Current Name: *Xus bus (Brown) Wood : : : :*

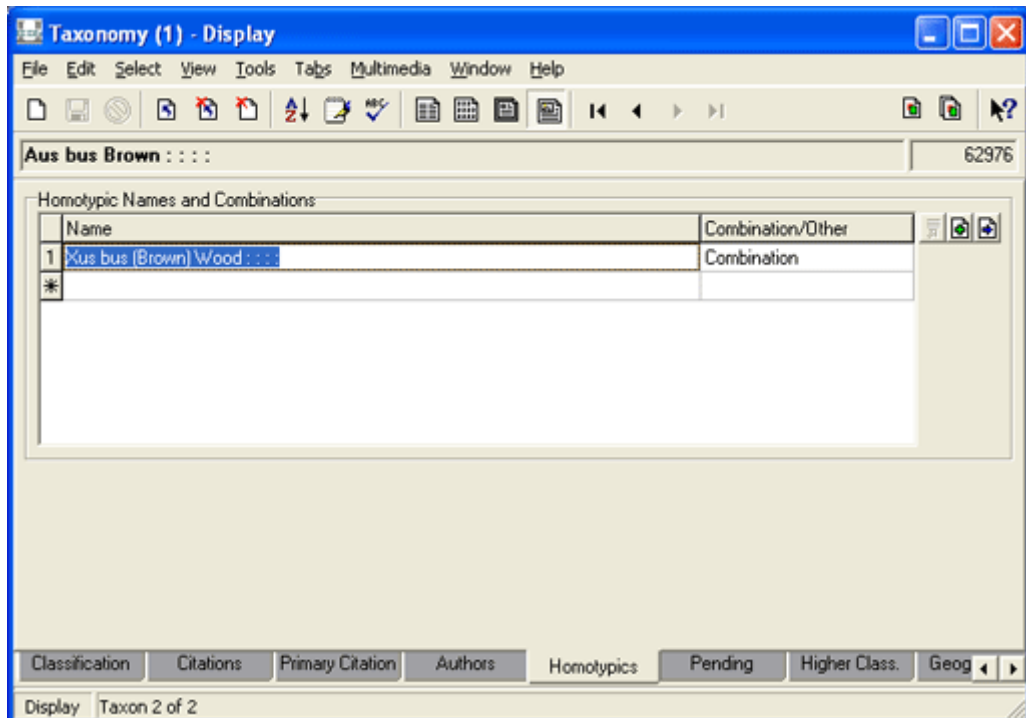
At the bottom, there are tabs for Classification, Citations, Primary Citation, Authors, Homotypics, All Synonyms, Pending, and High. The status bar at the very bottom shows 'Display Taxon 1 of 2'.



The new scientific name for *Xus bus* - *Xus bus* (Brown) Wood - indicates that the species name *bus* was not originally combined with *Xus*, that the author of the original name was Brown, and that Wood is the author of the current name.

Aus bus Brown and *Xus bus* (Brown) Wood are now synonyms of each other.

If we check the *Aus bus* Brown Homotypics tabs, we discover that *Xus bus* (Brown) Wood is listed and identified as a Combination synonym:



And on the the Homotypics tabs of *Xus bus* (Brown) Wood, *Aus bus* Brown is listed as a Combination synonym:

