SUBMITTING NAMES & ASSOCIATED DATA TO ITIS

The Integrated Taxonomic Information System (ITIS) partnership depends upon and accepts submissions of taxonomic data from the world scientific community. ITIS data stewards and other cooperating specialists in the systematics community submit and review data, and thereby enhance the scientific quality of ITIS data. Data are reviewed and verified, and each scientific name is assigned a Taxonomic Serial Number (TSN), which is a unique and persistent identifier of scientific names of biological organisms within the ITIS reference system.

OVERVIEW

ITIS Data Requirements

ITIS focuses resources on obtaining currently valid/accepted scientific biological names, but does accept synonyms. Data follow the international codes of nomenclature where applicable. The following data field groups are mandatory for submissions to ITIS (omission of any may result in processing delays):

1. Scientific Name of the species
2. Author(s) of the scientific name
3. Rank of the scientific name
4. Usage (current standing: accepted/valid; not accepted/invalid)
5. Parent scientific name (mandatory if Scientific Name is accepted/valid)
6. Associated Accepted Name (mandatory if Scientific Name is not accepted/invalid)
7. Unacceptability Reason (mandatory if Scientific Name is not accepted/invalid)
8. Reference for scientific name

These mandatory data fields or field groups and their formats are discussed in more detail under the section "ITIS Data Requirements." Other data fields that may be included in your data submission to ITIS are included following the required list.

ITIS Submittal Guidelines

For efficient submissions, ITIS requires two major tasks be performed. The submitter must:

1. Determine whether names to be submitted are already in the ITIS database. To do so, select one of two options:
   a. query the ITIS database for each name (this approach is best for a *small* number of names, and can provide full information for each name found)
   b. use the "Compare Taxonomy/Nomenclature" tool available on the ITIS website (this approach is best for a *large* number of names, but gives only TSNs for each name found)
2. Submit data for names not found in ITIS. To do so, determine:
   a. data fields and standards required by ITIS
   b. appropriate format of data file for submission (and tool used to create file)
   c. best option for file delivery

Detailed information on both of these topics is provided below.

For further information: contact us at <ITISGATE@si.edu> or by telephone at 1-202-633-2149,

or refer to further documentation on the ITIS Home Page at: <http://www.itis.gov>

Data Submittal Guidelines

1. How to Determine if Scientific Names are in the ITIS Database
Use one of two approaches below to check for the name in which you are interested, and for that of the parent of the name (this is the name in the classification hierarchy immediately above the name in question):

- an example name is the species name ***Ficus americana***
- the parent name is the genus name ***Ficus***

a. Single queries: search for one or small number of names
On the ITIS web site <http://www.itis.gov> you can enter individual names to find out if they are in ITIS. Be sure to specify the appropriate kingdom(s) in your searches. Note that protists are currently stored under Plantae and Animalia. As name spellings can vary, consider using wildcards (like Ficus americ*), rather than the complete name.
Another option for single-name queries is to use the ITIS*Canada site <http://www.cbif.gc.ca/itisca/>; this site is updated monthly from the main ITIS database.

b. Batch process: search for a large number of names
If you have many names you may want to check batches of names in one process using the online 'Compare Taxonomy/Nomenclature' method at <http://www.itis.gov/taxmatch_ftp.html>. The procedure involves sending a formatted file via FTP, then providing the filename in a web form. Comparison results are provided as a page in your web browser with presence or absence listed for each scientific name. The TSN is provided for each name that is found in ITIS.
If you don't find the "parent name" in ITIS, please add its parent to your list for submission. For each name you do not find in ITIS, consider accounting for spelling variation or typographical errors in your search; your "***Ficus americanus***" may be in ITIS as "***Ficus americana***," etc. If you believe ITIS has incorrect spellings, please note them when you deliver your submission.

2. How to Submit Names and Associated Data to ITIS
The following is a list of items to be considered while constructing your submittal. Included are various approaches that can be used. It is important to remember that providing data in a standardized manner will greatly increase the ability of ITIS to apply your data in an efficient and timely manner.

a. Tool options
Taxonomic Workbench tool (TWB)
You may build your data file in an ITIS-compatible hierarchy with the TWB available on the ITIS website at <http://www.itis.gov/twb.html>. The TWB User's Guide, also available from the web site in Adobe Acrobat PDF format at <http://www.itis.gov/twb_ug.pdf> may be consulted for assistance. Contact ITIS regarding standardization of data formats, particularly references or for other specifics regarding use of the TWB.
Third party software
- Database
- Spreadsheet
- Word processor or text editor

b. File Format
- This section is applicable only if you are exporting from or building your file with third party software.
- The format in which the data are received is of critical importance to the efficiency with which ITIS can process submitted names. Each file should contain a header record or row as the first row. The header record identifies the names of the data fields or field groups and facilitates manipulation of the file in preparation for import into the Taxonomic Workbench. The header record must include all data fields or field groups for which there are data in the file even if all records do not possess all data. Subsequent to the header row, each line should correspond to one complete record.
- The data fields or field groups comprising a record must be separated by a special character called a delimiter. The delimiter marks the beginning and end of a unit of data. Each field or field group position identified in the header record must be delimited even if no value exists. Characters such as | (pipe), * (asterisk), or tab can be used. It is best not to use characters embedded in your data.

Examples:

Pipe delimited text file
unit_name1|unit_name2|unit_name3|taxon_author|usage|rank_name|[parent_name]|reference
Canis|||Linnaeus, 1758|valid|genus|Canidae Fischer, 1817|Wilson & Reeder, 1993
Canis|familiaris||Linnaeus, 1758|valid|species|Canis Linnaeus, 1758|Wilson & Reeder, 1993
Canis|familiaris|familiaris|Linnaeus, 1758|valid|subspecies|Canis familiaris Linnaeus, 1758|Wilson & Reeder, 1993
Mus|||Linnaeus, 1766|valid|genus|Murinae Illiger, 1815|Wilson & Reeder, 1993
Mus|musculus||Linnaeus, 1758|valid|species|Mus Linnaeus, 1766|Wilson & Reeder, 1993

Spreadsheet

unit_name1	unit_name2	unit_ind3	unit_name3	taxon_author	usage	rank_name	[parent_name]	reference
Rosa				L.	accepted	genus	Rosaceae	Manual of the Vascular Flora of the Carolinas
Rosa	carolina			L.	accepted	species	Rosa L.	Manual of the Vascular Flora of the Carolinas
Rosa	carolina	var.	deamii	(Erlanson) Deam	accepted	variety	Rosa carolina L.	Midwestern Flowering Plant Survey, 1998

unit_name1	unit_name2	taxon_author	rank_name	usage	[parent_name]	unacceptability_reason	[accepted_name]
Lepidochelys		Fitzinger, 1843	Genus	valid	Cheloniidae Oppel, 1811		
Lepidochelys	kempii	(Garman, 1880)	Species	valid	Lepidochelys Fitzinger, 1843		
Lepidochelys	olivacea	(Eschscholtz, 1829)	Species	valid	Lepidochelys Fitzinger, 1843		
Thalassochelys	kempii	Garman, 1880	Species	invalid		subsequent name/combination	Lepidochelys kempii (Garman, 1880)
Caretta	remivaga	Hay, 1908	Species	invalid		junior synonym	Lepidochelys olivacea (Eschscholtz, 1829)
Chelonia	olivacea	Eschscholtz, 1829	Species	invalid		original name/combination	Lepidochelys olivacea (Eschscholtz, 1829)

Further Comments
If you are building a data file from scratch you might be better served using the TWB, database, or spreadsheet options. These tend to be easier to use in the creation of compatible files. If you have existing data and your options for exporting it from your system are limited, please contact ITIS to identify other options.

c. Data content
The details regarding the content of the data to be submitted are discussed in the ITIS Data Requirements section below.

d. File transfer
- The completed electronic file should be delivered to the ITIS Gatekeeper (preferably in a compressed format). If the file is relatively small (not exceeding 1MB), it can safely be sent as an email attachment to <ITISGATE@si.edu>. If it is larger, please contact the ITIS to arrange an alternative delivery method (probably FTP).
- Once the file has been received you will be sent a notification of receipt. Once the file has been assessed (normally within a week of receipt), we will provide estimates of time required for processing your data. If requested, we can provide status notifications.

Data Requirements

The MANDATORY requirements for each scientific name submitted are specified as follows:
(omission of any of these may result in processing delays)

1.   Scientific Name

Definition   The Latin name used to refer to a particular taxon of any rank (e.g., a subspecies, a genus, a family, etc.). The taxon author is frequently included when citing a scientific name, as it can help distinguish between different uses of the same name (such as homonyms).

Data Elements:

Name   unit_ind1
SQL Data Type   CHARACTER
Length 1
Default Nullity   NULL
Description   Indicator of an occurrence of a plant hybrid at the generic level.
Table   Taxonomic_Units
Values List   X
Validation Rules Applicable to the kingdom Plantae.

Name   unit_name1
SQL Data Type   CHARACTER
Length 35
Default Nullity   NOT NULL
Description   The singular or first part of a scientifically accepted label for an occurrence of Taxonomic Units.
Table   Taxonomic_Units
Validation Rules For uninomials (1-part names) this will be the only name field entered. For binomials/polynomials, this field will be used for the first part of the name. The names in this position require the initial letter to be capitalized.

Name   unit_ind2
SQL Data Type   CHARACTER
Length 1
Default Nullity   NULL
Description   A category indicator positioned between the first and second parts of a binomial/polynomial taxonomic name.
Table   Taxonomic_Units
Values List   X

Name   unit_name2
SQL Data Type   VARCHAR
Length 35
Default Nullity   NULL
Description   The second part of a scientifically accepted label for a binomial/polynomial occurrence of Taxonomic Units.
Table   Taxonomic_Units
Informix Name   unit_name2
Validation Rules   For binomials, this will be the last field populated for the name. For trinomials and quadrinomials, this will be the second position populated.

Name   unit_ind3
SQL Data Type   CHARACTER
Length 7
Default Nullity   NULL
Description   A category indicator located within a polynomial taxonomic name.
Table   Taxonomic_Units
Values List
        ssp. (plants and fungi)   subsp. (animals and monerans)
        var.
        subvar.
        f.
        subf.
        X

Name   unit_name3
SQL Data Type VARCHAR
Length 35
Default Nullity   NULL
Description   The third portion of a scientifically accepted label for a polynomial occurrence of Taxonomic Units.
Table   Taxonomic_Units
Validation Rules   For trinomials this field will be populated with the last part of the taxonomic name. For quadrinomials and hybrid formulas this field will be populated with the third part of the name.

Name   unit_ind4
SQL Data Type CHARACTER
Length 7
Default Nullity   NULL
Description   A category indicator located within a polynomial taxonomic name.
Table   Taxonomic_Units
Values List

   ssp. (plants and fungi)   subsp. (animals and monerans)
   var.
   subvar.
   f.
   subf.

Name   unit_name4
SQL Data Type VARCHAR
Length 35
Default Nullity   NULL
Description   The fourth part of a scientifically accepted label for a polynomial occurrence of
Taxonomic Units.
Table   Taxonomic_Units
Validation Rules   This is the final position populated for quadrinomials or hybrid formulas.

       Examples:
        Aceraceae:
        unit_name1=Aceraceae
        Rana pipiens:
        unit_name1=Rana and unit_name2=pipiens
        Cuscuta indecora var. *bifida*:
        unit_name1=Cuscuta, unit_name2=indecora, unit_ind3=var. and unit_name3=bifida
        Acris gryllus dorsalis:
        unit_name1=Acris, unit_name2=gryllus and unit_name3=dorsalis

Further Comments:
• Note that unit_name4 (and unit_ind4) should rarely be used. Under the International Code of Zoological Nomenclature (ICZN) quadrinomials (not considering the use of a subgenus name) are "unavailable", and normally would not be considered for addition to ITIS. According to the International Code of Botanic Nomenclature (ICBN), while quadrinomials (like hypothetical example *Dichanthelium ovale* var. *addisonii* subvar. *americanum*) are used with some frequency in the literature, they are not considered properly formed names. ITIS follows ICBN in re-forming such names within the Code's constraints; this does not constitute a nomenclatural act. The example given would be properly formed as *Dichanthelium ovale* subvar. *americanum*, though it may still have the variety as the parent. If necessary, ITIS will generally add quadrinomials in synonymy.
• Subgenera also pose a special case. ITIS stores subgenus records with the genus in unit_name1 and the subgenus in unit_name2 (in parentheses). Species in the subgenus are formed as usual (genus in unit_name1, specific epithet in unit_name2), and given the subgenus record as the "parent." The classification within the subgenus is thus maintained via the hierarchical parent association.
• Hybrid names can usually be accommodated, but would utilize the name fields differently from other scientific names. Please contact ITIS if you wish to submit hybrid names.

2. Author(s)
Definition The person(s) deemed solely responsible for the original description and naming of the taxon. Certain situations are handled differently under the ICBN (plants & fungi), the ICZN (animals), and the ICNB (bacteria). Full author information is required at genus rank and below (i.e., species, etc.), and optional above the rank of genus rank (i.e., families, etc.).
Input Rules Include the full author information in one field or element. "Protists" have historically been treated under both animal and plant traditions; please submit data according to the kingdom supported by your references.

Data Elements:

Name taxon_author
SQL Data Type VARCHAR
Length 100
Default Nullity NOT NULL
Description The author(s) associated with the name of a taxon.
Table Taxon_Authors_Lookup
Validation Rules For authorities associated with the animal kingdom, the author(s) and the actual date of the publication in which the author(s) first described the taxon are required. For authorities associated with the plant and fungi kingdoms, only author(s) is/are required. Note: Initially, authors/dates may not be available for all records.
Input Notes This element should specify the person(s) deemed solely responsible for the original description and naming of a taxon. Required for all names of genus or lower rank (genus, species, etc.); optional at family level and above. Under the ICBN (plants & fungi), revising author(s) responsible for the transferal of a species (or a name at any rank of species or below) to a different genus, or for certain rank changes (i.e., a subfamily name elevated to family rank) are added after the name(s) of the original author(s), which are then placed in parentheses. Author names generally follow standardized abbreviations in these kingdoms, and names and abbreviations can be looked up in "Authors of plant names: a list of authors of scientific names of plants, with recommended standard forms of their names" (Brummitt & Powell, eds., 1992), or online at <http://www.ipni.org>. The year of publication is usually not included, and is not required by ITIS. Under the ICZN (animals), the year should be included after the name of last author. ITIS uses a comma and a space to separate the author(s) and year. A revision in which a species or variety is transferred to a genus other than the original genus will result in parentheses around the author and year. The revising author is not cited. Author names are not abbreviated. Changing ranks within the same genus (i.e., from subspecies to species) will not result in parenthetical authorship. The International Code of Nomenclature of Bacteria (ICNB) follows the tradition of including both original and revising authors (as with the ICBN), but years are also included.

>   **Examples:**
>   **Following the ICBN traditions:**
>   (Nash) Gould & C.A.Clark
>   (Ashe) Freckmann
>   Bickn.
>   L.
>   (Miq.) Seem.
>   **Following the ICZN tradition:**
>   (Quoy and Gaimard, 1832)
>   Roper, 1968
>   (Férussac, 1834)
>   (Appellöf, 1886)
>   Linnaeus, 1758
>   **Following the ICNB tradition (with commas):**
>   (Van Saceghem, 1915) Gordon, 1964
>   Stackebrandt et al., 1995
>   (Collins and Stackebrandt, 1989) Tamura and Yokota, 1994
>   Ophel and Kerr, 1990

3. Rank

Definition The particular level in a taxonomic classification that a name occupies. For example,the taxonomic rank of Homo sapiens is species. ITIS follows the ICBN and ICZN regarding what ranks are recognized below the family level. ITIS currently supports ranks down to "subspecies" for monerans.
Input Rules ITIS uses internal identifiers to associate names with ranks. For the purposes of submitting data, the rank name is needed.

Data Elements:

Name rank_name
SQL Data Type CHARACTER
Length 15
Default Nullity NOT NULL
Description The label associated with the specific level of a taxonomic hierarchy.
Table Taxonomic_Unit_Types

Values List

Plant/Fungi Ranks	Animal Ranks	Moneran Ranks
Kingdom	Kingdom	Kingdom
Subkingdom	Subkingdom	Subkingdom
Division	Phylum	Phylum
Subdivision	Subphylum	Subphylum
	Superclass	Superclass
Class	Class	Class
Subclass	Subclass	Subclass
	Infraclass	Infraclass
	Superorder	Superorder
Order	Order	Order
Suborder	Suborder	Suborder
	Infraorder	InfraOrder
	Superfamily	Superfamily
Family	Family	Family
Subfamily	Subfamily	Subfamily
Tribe	Tribe	Tribe
Subtribe	Subtribe	Subtribe
Genus	Genus	Genus
Subgenus	Subgenus	Subgenus
Section		
Subsection		
Species	Species	Species
Subspecies	Subspecies	Subspecies
Variety		
Subvariety		
Form		
Subform		

Further Comments:

- If you wish to submit names that have ranks other than these, please contact ITIS.
- "Protists" have historically been treated under both animal and plant traditions; please submit data under the system supported by your references.

4. Usage

Definition Current standing of a scientific name.

Input Rules Each scientific name is categorized as in current use or in synonymy. For plants and fungi, usage can be "accepted" or "not accepted." For animals and monerans, usage can be "valid" or "invalid" ("protists" are not yet fully supported as a kingdom in ITIS and are categorized under their historical kingdom placement). If the submission is categorized as not accepted or invalid, an additional data element providing a reason is required. This "unacceptability reason" provides further clarification regarding why a name is placed in synonymy.

Data Elements:

Name   usage
SQL Data Type   VARCHAR
Length 12
Default Nullity   NOT NULL
Description   Current standing of an occurrence of Taxonomic Units.
Table   Taxonomic_Units
Values List
accepted (plants and fungi)
not accepted (plants and fungi)
valid (animals and monerans)
invalid (animals and monerans)
Validation Rules Choice lists are dependent upon the values associated with a kingdom.

5. Parent

Definition An ITIS term denoting the taxon that is the next highest level from the subject valid or accepted taxon. The parent of a species is usually a genus; the parent of a genus is usually a family, and so on. This parent-child linkage between records is the basis for the classification hierarchy in ITIS.

Notes ITIS will need to connect your submitted name(s) to existing names before it (they) can be added to the ITIS database. If the direct parent of a given name in your list is not in ITIS, then we would need to look for its parent at the next higher level, and so on, until a connection can be made to the existing hierarchy in ITIS. All the intervening names will need to be added to the ITIS database along with your name; all pertinent names should be included in your submission. Please add the parent of any name you cannot find in ITIS (including parents of parents, etc.) to your list. There is rarely more than one intervening name to add, but it is possible that more would be needed.

Input Rules All valid/accepted names must have one and only one "parent". The format for the "parent" entry in a given record is to include the full name AND author (if applicable) of the parent in one field.

> **Examples:**
> Species=*Homo sapiens*; enter parent=*Homo* Linnaeus, 1758
> Genus=*Arum*; enter parent=Araceae (this family does not have an author in ITIS)

Further Comments:

- If you are unable to provide the parent with your submission, please include one or more fields for whatever classification hierarchy information you have, or indicate the group to which the named taxon is a member (i.e., bird, mayfly, mushroom, etc.). These bits of information will help us identify appropriate specialists and references we might consult for verification. Again, incomplete submissions usually take longer to process.
- "Incertae sedis" (uncertain seat/position) is a special circumstance where a name is considered valid or accepted but is of uncertain position in a classification (i.e., it is known to be in a particular order, but the family it should be assigned to is not known). This circumstance occurs in groups that are poorly known or for taxa that are particularly difficult to classify. If you wish to submit names that will involve the use of this concept, please contact ITIS.

6. Associated Accepted Name

Definition The scientific name, including author, of the valid or accepted taxon identified as the currently accepted name used for a given invalid or not accepted name. Each name that is in synonymy (junior synonyms, obsolete combinations, etc.) must be connected to one accepted or valid name. The concept of "parent" is not applicable in such cases.

Notes ITIS bases the "accepted name" linkage upon the current identification of the type specimen to which the name is anchored. For all names from superfamily down to the lowest ranks, there should be a type (a specimen) to which the name is ultimately attached (for higher ranks, there is a type taxon, but ultimately these too can be connected to a single specimen. The type specimen upon which the species name "*Corallus enydris*" was based is now identified as a member of the species "*Corallus hortulanus*." Thus, the "accepted name" for *Corallus enydris* is *Corallus hortulanus*.

Input Rules As with "parent" links (see above), the full scientific name and author values from the parent record must be combined into one field in your submission file, in this case under the "accepted name" field.

7. Unacceptability Reason

Definition An explanation regarding why a given scientific name is judged to be invalid or not accepted. Unacceptability reasons vary among kingdoms.

Data Elements:

Name   unacceptability_reason
SQL Data Type   VARCHAR
Length   24
Default Nullity   NULL
Description   The cause for an occurrence of Taxonomic Units being identified as not accepted/invalid under the usage element.
Table   Taxonomic_Units
Values List

ANIMALIA & MONERA	Definition
junior synonym	The later established of two or more names of the same rank used to denote the same taxon. For species, the epithet and author(s) are different from those of the accepted name.
original name/combination	The form or combination (i.e., genus + species) of a name as published in the original description (= senior synonym). The specific or subspecific epithet is the same as that of the accepted name (allowing for gender/form changes) and the author(s) and date are never bounded by parentheses. For any given accepted name, there should be only one original name/combination.

ANIMALIA & MONERA	Definition
subsequent name/combination	The form or combination (i.e., genus + species) of a name that is different from both the original and the currently accepted combinations (= names) and is used to denote the same species or subspecies. The specific or subspecific epithet (allowing for gender/form changes) and the author(s) and date are the same as for the accepted name (though the use of parentheses may vary). Essentially, this will be the case for any combination with the same epithet and authorship that is neither the original nor the currently accepted name.
junior homonym	The latter published of two or more names with the same spelling and used to refer to different nominal taxa (family and genus group names) or for species and subspecies, to different nominal taxa that were either originally (primary homonym) or subsequently (secondary homonym) combined with the same generic name. To be available, a junior homonym requires a replacement name and the replacement name is based on the same type specimen.
homonym & junior synonym	One of two or more names of the same rank and with the same spelling that were used to denote the same or different taxa. The older name (= senior homonym) may be available, or, for this specific unacceptability reason, may itself be the synonym of an older name for a different taxon. No replacement name is needed for a homonym that is also a junior synonym.
unavailable, database artifact	A name that is misspelled in the ITIS file, cannot be verified by any reference or expert, and likely resulted from a keystroke error, or any other database artifact (e.g., place-holders, common name entered as scientific name, etc.) that originated within NODC or ITIS.
unavailable, literature misspelling	A name that has been misspelled in the literature (i.e., not a database artifact).
unavailable, incorrect orig.[inal] spelling	A name that was incorrectly spelled in the original description; such errors must be corrected (emended) according to the Code of Zoological Nomenclature. A name with such a spelling is "unavailable" in that original, incorrect form.
unavailable, suppressed by ruling	A name that has been suppressed (made 'unavailable') for use in referring to a specific taxon by a ruling of the International Commission on Zoological Nomenclature.
unavailable, nomen nudum	A name published without sufficient descriptive information to satisfy the criteria of availability.
unavailable, other	A name that is unavailable for a variety of other reasons (e.g., non-binomial, anonymous after 1950, etc.) not covered in the previous list. This is essentially a 'catch-all' category for other reasons for unavailability.
unjustified emendation	A change or correction (emendation) in the spelling of a name that was shown subsequently not to have been needed, to be unsupported by the International Code of Zoological Nomenclature, or to have been improperly published.
unnecessary replacement	A replacement name that was not needed, either because the original name was not a homonym or because a prior substitute name was already available. In instances where the replacement name itself was unavailable, use 'unavailable, other' or 'other, see comments' as the reason.
nomen oblitum	A reversal of precedence where a senior (older) name that has been forgotten (lost) is judged to apply to a taxon that has been known for many years by a younger name. The older name is formally placed in the synonymy of the younger name; the older name remains available, but does not take precedence. The junior name, which has taken priority, may be called a "nomen protectum."
misapplied	An indication sometimes used in the literature to refer to a misapplied name or a name incorrectly applied to a species (i.e., a misidentification). Use of this reason is strongly discouraged in ITIS (the name may be valid or accepted, just not as applied).
pro parte	An designation sometimes used in the literature to indicate that only some of the specimens referred to by a specific name in a specific reference actually represent that taxon. This may happen in a type series (syntypes) and can be troublesome if a lectotype has never been designated. This may be a misidentification or a consequence of incomplete knowledge. Use of this reason is strongly discouraged in ITIS.
other, see comments	Any other reason relative to unacceptability not covered above; typically a Comment is used to specify relevant issues. If you wish to do this, please contact ITIS at the email address or telephone number given above.
nomen dubium	A name having uncertain application because it is impossible to establish the taxon to which it should be referred. If you want to include a "nomen dubium" in a submission, please contact ITIS at the email address or telephone number given above.

PLANTAE & FUNGI	Definition
synonym	One of two or more names applied to the same taxon, but not to the same type (heterotypic); also used for non-current combinations of the accepted epithet (e.g., a usage placing the same species in another genus). For names in synonymy that ITIS would accept in a submission, this would be the only common unacceptability reason.
homonym (illegitimate)	Two or more identical epithets or combinations denoting different taxa of the family, genus or

PLANTAE & FUNGI	Definition
	species-group, or of species or subspecies within the same genus (same name, different type). This is one of two kinds of illegitimate names, which must be rejected for the purpose of priority.
superfluous renaming (illegitimate)	A second validly published epithet applied to the same type as an earlier name (same type, different name). This is one of two kinds of illegitimate names, which must be rejected for the purpose of priority.
rejected name	A name which was explicitly rejected in the ICBN Appendices II-IV. Such names can be noted as "nom. rej." in the literature.
invalidly published, nomen nudum	A name published without sufficient descriptive information to satisfy the criteria of availability or valid publication.
invalidly published, other	Any case of "invalid publication" besides nomen nudum. This also includes names appearing in specified ranks within oppressed publications (Appendix V of the ICBN covers "opera utique rejicienda," or "entirely oppressed works").
misapplied	A name inappropriately applied to a specimen or distribution (for example, using the name of an endemic European species for a North American specimen). Such uses occur in checklists and other lists at times. Inclusion in ITIS submissions is strongly discouraged. Note that the name may be accepted, just not as applied in this case.
pro parte	Used in nomenclature to indicate that only part of the taxon (excluding the nomenclatural type) is being referred to. Inclusion in ITIS submissions is discouraged.
horticultural	A special kind of name for a plant that may or may not be found in nature. There is a separate nomenclatural code for horticulture that is not addressed in ITIS at present.
database artifact	Generally assigned to NODC or ITIS data that can't be verified by any reference or expert. May represent a keystroke error by NODC or ITIS, or a duplicate record. NOT used in ITIS submissions.
orthographic variant (misspelling)	Two or more different spellings of the same name.
other, see comments	This is reserved for anything that does not fall under the categories listed above. Please contact ITIS at the email address or telephone number above if you wish to use this reason.

Validation Rules This element is required when usage is set to not accepted (plants and fungi) or invalid (animals and monerans). Only those reasons for a particular kingdom should be displayed.

8. Reference for scientific name

Definition A publication, expert, or other source that provides information relating to a name or associated information.
Input Rules The references portion of the ITIS data model is slated for revision. For this reason, entry of references may be performed in either of two ways: by providing individual data fields as specified below; or by entry of an abbreviated citation (e.g. Wilson and Reeder, 1993) in one field for each record with the full citation provided separately for later substitution.

Data Elements:

Name   reference_author
SQL Data Type VARCHAR
Length 100
Default Nullity   NOT NULL
Description   Writer(s) of a printed reference.
Table   Publications
Input Notes   Include the author(s) and editor(s) of the publication. The first author's name should be inverted (last name first, see examples below). If initials are included with the author then use a period after them and separate multiple initials with a period and a space (as in W. E. Bemis, not WE Bemis or W.E. Bemis). Separate the list with commas, with ", and " before the final author. If editors are to be cited, they should follow the last author, after inserting a " / " (space-slash-space). The last editor should be followed by ", ed." or   ", eds." (comma-space-ed(s)-period). Editor names should be handled similar to author names, inverting the first editor, separating multiple editors with commas, and adding ", and " before the last editor. If you exceed the number of allotted characters in the author field, type "et al." after the last complete name you can fit. Diacritical marks (é, ö, etc.) are supported by ITIS.
   Examples
        Bemis, William
        Bemis, William E.
        Bemis, W. E.
        Bemis, William E., Eric K. Findeis, and Lance Grande
        Hasle, Grethe R., and Erik E. Syvertsen / Carmelo R. Tomas, ed.
        Bemis, William E. / King, F. Wayne, ed.
        Bemis, William E. / King, F. Wayne, and Russell L. Burke, eds.
        Roper, Clyde F. E., C. C. Lu, and Michael Vecchione / Voss, N. A., M. Veccione et al., eds.

Name   title
SQL Data Type   VARCHAR
Length   255
Default Nullity   NULL
Description   The identifying name given an article contained in a printed reference.
Table   Publications
Input Notes   Do not use except for references within a larger printed work. This is the identifying name of a contribution within a printed reference, such as an article contained in a journal or a chapter in a book. Generally, follow the reference's format for capitalization; however, if the reference uses all upper-case, then convert the capitalization to only the first letters of the first word, scientific names, proper nouns, and appropriate words. Secondary titles should be separated from the primary titles by a colon (:) and two spaces. If the title exceeds 255 characters, truncate it to fit and place three periods (...) after the last complete word that fits (add the full title in the publication comment field so it can be recovered later). Diacritical marks (é, ö, etc.) are supported.
   Examples
      Chapter 5: Factors affecting activity in Cnemidophorus
      On the Vestimentifera, new phylum: Six new species, and other taxa, from hydrothermal vents and elsewhere
      The Gladius in Teuthoid Systematics
      The land and sea mammals of Middle America and the West Indies

Name   publication_name
SQL Data Type   VARCHAR
Length   255
Default Nullity   NOT NULL
Description   The identifying title of the printed reference, including volume and number, if applicable.
Table   Publication
Input Notes   This is the identifying name of an overall printed reference (such as a book or journal). The name should be written out completely (do not abbreviate). For capitalization, generally, follow the reference's format unless it uses all upper-case, in which case convert the capitalization to only the first letters of the first word, scientific names, proper nouns, and appropriate words. Secondary names should be separated from the primary name by a colon (:) and two spaces; volumes, numbers, etc., should appear after the name of the book or journal, preceded by a comma & space, as vol. 3, no. 5, Second Edition, etc. If the publication name exceeds 255 characters, truncate it to fit and place three periods (...) after the last complete word that fits (but <u>do</u> include needed volume/number info!); if the name is truncated in this manner, add the full publication information in the publication comment field so it can be recovered later. Diacritical marks (é, ö, etc.) are supported.
   Examples
      Biology of Whiptail Lizards (Genus Cnemidophorus)
      Fishes of the World, Third Edition
      A Catalogue of the Portland Museum
      Aquatic Oligochaeta of the World
      Bulletin of the American Museum of Natural History, vol. 85

Name   listed_pub_date
SQL Data Type   DATE
Length   10
Default Nullity   NULL
Description   The date printed on a journal or other printed reference.
Table   Publications
Input Notes   Format as DD/MM/YYYY. If the day and month are not known or not applicable, enter as 01/01/YYYY. See actual_pub_date for examples.

Name   actual_pub_date
SQL Data Type   DATE
Length   10
Default Nullity   NOT NULL
Description   The true date on which a journal or other written reference was published. It may or may not correspond with the publication's listed date.
Table   Publications
Validation Rules This date should be later than or equal to the listed date if such is populated. It should also correspond to the date associated with the taxon_author if this is the reference in which the subject taxon is described. If the day or month are missing, they should default to 01.
Input Notes The date that represents the actual date of publication. It may or may not correspond with the publication's listed date. It is generally later than or equal to the listed date, though there are rare exceptions. "Pre-prints"(normally identical to the final print, but printed before the formal printing for various reasons), if they must be entered, will generally have an earlier 'actual' than 'listed' date, and should be entered with identical information to the final print's, but with the

different 'actual' date. Format as DD/MM/YYYY. If the day and month are not known or not applicable, enter as 01/01/YYYY.

Examples

12 September, 1997 should be written as: 12/09/1997

September, 1997 should be written as: 01/09/1997

The year 1997 should be written as: 01/01/1997

Name publisher

SQL Data Type VARCHAR

Length 80

Default Nullity NULL

Description Producer of a printed reference.

Table Publications

Input Notes (Applies to books only) The publisher's name (and affiliation, if appropriate). Do not abbreviate. Diacritical marks (é, ö, etc.) are supported.

Examples

Smithsonian Institution Press

Sears Foundation for Marine Research, Yale University

Fish and Wildlife Service, United States Department of the Interior

Name pub_place

SQL Data Type VARCHAR

Length 40

Default Nullity NULL

Description Location of the publisher of a printed reference.

Table Publications

Input Notes (Applies to books only) The location of the publisher, including country. The location should be written out as city, state, country (assuming they are given or can be deduced). If multiple cities are listed, use the first one listed. A comma and then a space should separate all items.

Examples

Rome, Italy

Bethesda, Maryland, USA

Name isbn

SQL Data Type VARCHAR

Length 35,0

Default Nullity NULL

Description International Standard Book Number - a unique numeric identifier for books; older publications and some foreign books do not have assigned ISBN numbers. The ISBN may identify a particular year or monograph in an ongoing serial or series.

Table Publications

Input Notes The International Standards Book Number (ISBN) is an internationally accepted code printed in publications that is unique to a title, edition of a book, or a monographic publication published or produced by a specific publisher or producer. There are four parts to an ISBN: a group identifier, publishers prefix, title number, and a check-digit.

Example

0-00000-000-0

Name issn

SQL Data Type VARCHAR

Length 35,0

Default Nullity NULL

Description International Standard Serial Number - a unique numeric identifier for periodicals; older journals and some foreign publications do not have assigned ISSN numbers. The ISSN may identify an overall serial.

Table Publications

Input Notes The International Standards Serial Number (ISSN) is an internationally accepted identification code printed in serial publications. An eight-digit number consisting of seven digits plus a check-digit that enables a computer to recognize when a number is incorrectly cited. This digit may be an "X", otherwise the number is fully numeric.

Example

0000-0000

Name pages

SQL Data Type VARCHAR

Length 15

Default Nullity NULL

Description Page numbers within a printed reference to which the specific citation refers.

Table Publications

Input Notes This should include the total number of pages in the book. If a book is in two or more volumes, and the second, third, fourth etc. volume has page numbers that begin at the end of the preceding volume, then include the continuous page numbers. If the publication is an original description, then the page number of the specific instance of the name should be cited. If preface/foreword pagination is desired, this may be included.

    Examples
        Number-Number: 1-250
        Number-Number: 251-500 (The pages might appear like this for a volume other than the first)
        Number: 250
        Roman numeral + Number: iv + 267

Name   pub_comment
SQL Data Type TEXT
Length 500
Default Nullity   NULL
Description   Remarks associated with the printed reference cited.
Table   Publications
Input Notes This field is used for any pertinent information about the publication.
    Example
        As of 05-Feb-1998, this reference has yet to be published

Name   expert
SQL Data Type VARCHAR
Length 100
Default Nullity   NOT NULL
Description   The name of the taxonomic expert providing credence to the taxonomy, nomenclature or attributes of a Taxonomic Units' occurrence for the ITIS.
Table   Experts
Input Notes An expert in the particular field of study who is a source for a name. First name, middle initial and last name. This may vary according to the expert's preference.
    Example
        Wayne X. Starnes

Name   exp_comment
SQL Data Type TEXT
Length 500
Default Nullity   NULL
Description   Remarks noted by or associated with a taxonomic expert who is providing credence to the taxonomy, nomenclature or attributes of a Taxonomic Units' occurrence.
Table   Experts
Input Notes This should include contact information for the expert. Include, where possible: Title of Expert, Name of Expert's Organization, P.O Box (if applicable), City, State, Zip Code, and Country. Do not include linefeed/return characters in the comments field.
    Example
        Research Curator of Fishes, North Carolina State Museum of Natural Science, PO Box 000, Raleigh, North Carolina, 00000, USA

Name   source_type
SQL Data Type CHARACTER
Length 10
Default Nullity   NOT NULL
Description   The designation of the kind of supplier providing information to the ITIS (other than a person or publication); e.g. database.
Table   Other_Sources
Input Notes This should reflect the type of source that is associated with the record.
    Examples
        database, website, CD-ROM

Name   source
SQL Data Type VARCHAR
Length 64
Default Nullity   NOT NULL
Description   The name of the supplier of information, other than a person or publication, to the ITIS.
Table   Other_Sources
Input Notes This should reflect from where the source came
    Examples

NODC, Smithsonian, PLANTS, Zoological Record

Name version
SQL Data Type CHARACTER
Length 10
Default Nullity NOT NULL
Description Number, date or other identifying characteristic of the source which indicates the functionality and/or data at a point in time in the life of the system, database, etc.
Table Other_Sources
Input Notes This should reflect the specific version of the source associated with record; this may be cited by the source as a number (version 1.0) or a date (revised 18-Feb-00). Note that there is sometimes no explicit version number provided; if no useful version information is available, use version number 0 (zero), as this is currently a required field.
   Examples
      1.0, 18/02/1999

Name source_comment
SQL Data Type TEXT
Length 500
Default Nullity NULL
Description Remarks associated with the provider of information to the ITIS (other than a person or publication).
Table Other_Sources
Input Notes Comments may include further detailed information on the source, if appropriate. If the source is a resource on the Internet, you can provide the address (URL) here.
   Example
      "This was written as X on the website of Y"

Further Comments:
Generally, ITIS requires one or more references that support the submittal. You may wish to use a short identifying phrase (Wilson & Reeder, 1993) in your data file, and provide the complete bibliographic citation separately. We can add the full data in place of the shorthand. If you are dealing with original publications of a name (i.e., the reference in which a name was first published), please include a field or column to indicate that fact. In addition to traditional printed references (journal articles, books, etc.), ITIS can store other kinds of references. Experts and other sources, such as websites and databases are of interest to ITIS. Please contact ITIS if you intend to use any of these non-traditional references, or if you have any questions about how ITIS handles references and citations.
If you cannot provide a reference for the name, any context you might have could help (i.e., it is from a stream survey from the Pacific Northwest of the U.S.).

ASSOCIATED DATA

Vernacular (common) names
Definition a name other than a scientific name that is commonly used to refer to a species or other taxon. Examples are rainbow trout, red-winged blackbird, fence lizard, etc. The language (e.g., English, etc.) must be indicated for each vernacular name.

Data Elements:

Name vernacular_name
SQL Data Type VARCHAR
Length 80
Default Nullity NOT NULL
Description A common name associated with an occurrence of Taxonomic Units.
Table Vernaculars

Name language
SQL Data Type VARCHAR
Length 15
Default Nullity NULL
Description Native language from which the vernacular name originates; e.g. American, English, Russian, Spanish, etc.
Table Vernaculars

Name approved_ind
SQL Data Type CHARACTER
Length 1

Default Nullity   NULL
Description   Designation identifying those vernacular names authorized for use by regulation, statute, etc.
Table   Vernaculars
Values List   Y/N If selected, the indicator will be set to true.
Validation Rules If the approved_ind is set to true, then the reference identifying the vernacular must be entered.

Further Comments:
- ITIS tries to adhere to the standards for capitalization within specialist communities, where they exist. Otherwise we generally only capitalize proper nouns.
- Language (of vernacular) – It can be exceedingly difficult and time-consuming (and often futile!) to categorize some vernaculars in terms of language. They often are transliterated and further altered over time such that they no longer correspond to any language, *per se*. Therefore, where there is no clear indication of language for a vernacular, ITIS categorizes a vernacular according to the language of the reference in which it is found.

Geographic/Distribution information
Definition ITIS supports inclusion of coarse distribution information.

Data Elements:

Name   geographic_value
SQL Data Type   VARCHAR
Length 40
Default Nullity   NOT NULL
Description   Label given a geographic division as identified by the Taxonomic Work Group.
Table   Geographic_Division
Values List
TERRESTRIAL & FRESHWATER
- North America - the United States (excluding Hawaii), Canada and Greenland.
- Middle America - US-Mexico border south to Colombia-Panama border (Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, Panama).
- Caribbean - the islands of the Caribbean: Bahamas, Puerto Rico, Cuba, Virgin Islands (UK & US), Jamaica, Haiti, Cayman Islands, Dominican Republic, Trinidad-Tobago, the Lesser Antilles including Aruba, Curacao, the Leeward Islands (Antigua-Barbuda, Anguilla, Aves, Guadeloupe, Montserrat, Antilles, St.Kitts-Nevis, St. Martin-St. Barthelemyl) and the Windward Islands (Barbados, Donimica, Grenada, Martinique, St. Lucia, St. Vincent) and Bermuda.
- South America - from the Panama-Columbia border south (Columbia, Venezuela, Guyana, Surinam, French Guiana, Brazil, Ecuador, Peru, Bolivia, Paraguay, Uruguay, Argentina, Chile) including the adjacent islands of the Galapagos, Falklands, San Felix, Trindade, Fernando de Noronha and Juan Fernandez Islands.
- Europe & Northern Asia (excluding China) - Europe (Portugal, Spain, the Azores, and Madeira islands, France, Luxembourg, Belgium, Netherlands, Germany, Switzerland, Denmark, Finland, Sweden, Norway, Austria, Italy, Greece, Turkey, Cyprus, Poland, Czech Republic, Republic of Slovakia, Romania, Hungary, Bulgaria, Albania, Yugoslavia (Serbian Republic and the Republic of Monte Negro), Macedonia, Slovenia, Crotia, Bosnia), the United Kingdom (Scotland, Wales, England and Northern Ireland), Ireland, Iceland, Russia and the newly indendent states of the former Soviet Union (Georgia, Azerbaijain, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, Ukraune, Belarus, Lithuania, Latvia, Estonia), the Arabian Peninsula (Israel, Lebanon, Jordan, Syria, Saudi Arabia, Yemen, South Yemen, Oman, United Arab Emirates, Kuwait, Bahrain), the Middle East (Iraq, Iran, Afghanistan), and Mongolia.
- Africa - the continent of Africa (Morocco, Algeria, Libya, Egypt, Mauritania, Mali, Niger, Chad, Sudan, Ethiopia, Somalia, Senegal, the Gambia, Guinea Bissau, Guinea, Burkina, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Central African Republic, Uganda, Kenya, Rwanda, Burundi, Zaire, Congo, Gabon, Angola, Zambia, Malawi, Tanzania, Mozambique, Zimbabwe, Namibia, Botswana, Swaziland, Republic of South Africa, Lesotho) including Madagascar, the Seychelles, Mauritius, and the Comers islands off the south east coast of Africa and the islands of Sao Tome, Principe, Canaries, Cape Verde, Ascension, St. Helena, and Tristan de Cunha off the west coast of Africa.
- Southern Asia - China, Pakistan, India, Sri Lanka, the Maldives, Nepal, Bhutan, Bangladesh, Burma, North Korea, South Korea, Japan, Thailand, Laos, Cambodia, Viet Nam, Malaysia, Taiwan, the Philippines, Borneo, Indonesia, Singapore.
- Australia - Australia including Tasmania, Macquarie, Lord Howe, and Norfolk Island, the Island of New Guinea including Irian Jaya and Papua New Guinea, the Bismarck Archipelago, Solomon Islands, New Hebrides (Vanuatu), New Caledonia, New Zealand including Chatham, Bounty, Antipodes, Aukland and Campbell islands.
- Oceania - the Pacific islands - Micronesia, Polynesia, Palau, Guam, Truk, Marshall Islands, Kiribati, Midway Islands, Fiji, Tonga, Samoa, Cook Islands, Tuamotu, Line Islands, Tokelau, Tuvalu, Phoenix Islands, Easter Island, the Marqueses, Tahiti, the Hawaiian Islands.
MARINE (technically also includes TERRESTRIAL and FRESHWATER habitats)
- Antarctica/Southern Ocean - Antarctic Continent and islands, and ocean below 40 degrees South latitude, not including the tip of South America or Australia.
MARINE (including shoreline between high & low tides)

- Eastern Atlantic Ocean - marine habitats along the western coast of Europe and Africa to the Mid-Atlantic Ridge, including the Mediterranean and Caspian Seas, and littoral habitats along the continental coasts and inclusive islands.
- Western Atlantic Ocean - marine habitats west of the Mid-Atlantic Ridge to the eastern shore of North, Middle, and South America including the waters of the Caribbean and Gulf of Mexico and littoral habitats along the continental coasts and inclusive islands.
- Indo-West Pacific - marine habitats of the Indian Ocean including the Red Sea and the Persian Gulf and the Western Pacific Ocean west to and including the waters around Hawaii and Easter Island.
- East Pacific - marine habitats in the Western Pacific east of Hawaii and Easter Island to and including the littoral habitats of the west coasts of North, Middle and South America and the associated off shore islands out to the Galapagos.

Jurisdiction information

Definition ITIS supports the inclusion of information designating which of several North American political jurisdictions of interest to the U.S. and Canada the species is found. For each jurisdiction, the species can be assigned a value of "Native," "Introduced," "Native & Introduced," or "Incidental" (the species has been recorded for the jurisdiction, but is regarded as not established or naturalized, such as with a single exotic bird blown in by a storm, or escaped from captivity).

Data Elements:

Name   jurisdiction_value
SQL Data Type   VARCHAR
Length   30
Default Nullity   NOT NULL
Description   Label signifying a US jurisdictional unit as defined by the TWG, and Canada.
Table   Jurisdiction
Values List
- Continental US - 48 contiguous US states between Mexico and Canada.
- Alaska - state of Alaska including St. Lawrence Island and the Aleutian Islands.
- Hawaii - state of Hawaii (northwestern island chain from Pearl and Hermes Reef to Nihoa (sometimes called Bird Islands) and islands of Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Kahoolawe, and Hawaii.
- Central Pacific Territories - Commonwealth of the Northern Mariana Islands, Guam, American Samoa, Baker Island, Howland Island, Jarvis Island, Johnston Atoll (Johnston Island), Kingman Reef, Palmyra, Midway Islands, and Wake Island.
- Caribbean Territories - the Commonwealth of Puerto Rico, US Virgin Islands (St. John, St. Thomas, and small surrounding islands), and Navassa Island.
- Canada - 12 provinces and territories.
- Mexico - 31 states and 1 federal district.

Name   origin
SQL Data Type   VARCHAR
Length   19
Default Nullity   NOT NULL
Description   Indication of whether an occurrence of Taxonomic Units is native and/or introduced to a US jurisdictional unit.
Table   Jurisdiction
Values List
Native
Introduced
Native & Introduced
Incidental
Native & Extirpated
Native & Extinct