

M.Sc. 1st Semester; Course Code: Zoo-01-CR; Unit: II**2.2. ICZN, Homonymy, Synonymy and Law of Priority****A) ICZN**

The *International Code of Zoological Nomenclature* (ICZN) is a book containing a set of rules and recommendations on the formal naming of animals. Among Zoologists as well as in the book, it is often referred to simply as "the Code" while Taxonomists refer to it as "the ICZN". It was first published in 1961, although it has precedents going back to 1842; the present edition is the fourth edition (1999). The Code is issued by the International Commission on Zoological Nomenclature. As the Commission may alter the Code without issuing a new edition of the book, it is not necessarily that the book may contain the actual provision that applies in a particular case. The Code deals with Zoological nomenclature, which is defined in the Glossary as –

"The system of scientific names for animal taxa and the provisions for the formation, treatment and use of those names." Zoological nomenclature is independent of other systems of nomenclature. The rules and recommendations have one fundamental aim: to provide the maximum universality and continuity in the naming of all animals, except where taxonomic judgment dictates otherwise. The Code is meant to guide only the nomenclature of animals, while leaving the Zoologists freedom in classifying new taxa. In other words, whether a species itself is or is not an entity to be recognized is a subjective decision, but what name should be applied to it is not; the Code applies only to the latter, not to the former. A new animal name published without adherence to the Code may be deemed simply "unavailable" if it fails to meet certain criteria, or fall entirely out of the province of science. The rules in the Code determine what names are valid for any taxon in the family group, genus group, and species group. It has additional (but more limited) provisions on names in higher ranks. The Code recognizes no case law. Any dispute is to be decided first by applying the Code directly, and not by reference to precedent.

Principles

Animal names are regulated by six central principles, which were first set out in the third edition of the Code (1985):

- i) Principle of Binominal Nomenclature
- ii) Principle of Coordination
- iii) Principle of the First Reviser
- iv) Principle of Homonymy
- v) Principle of Priority
- vi) Principle of Typification

Structure

The Code divides names in the following manner:

- a) Names above the family group.
- b) Family-group names.
- c) Genus-group names.

d) Species-group names

The names above the family group are regulated only as to the requirements for publication; there is no restriction to the number of ranks and the use of names is not restricted by priority. The names in the family group, the genus group and the species group are fully regulated by the provisions in the Code. There is no limitation to the number of ranks allowed in the family group. In the genus group there are only two ranks: the genus and the subgenus. In the species group there are only two ranks: the species and the subspecies.

Gender agreement

In the species group gender agreement is of paramount importance. The name of a species is in two parts (a binomen) say, *Loxodonta africana*, and of a subspecies, in three parts (a trinomen) say *Canis lupus albus*, originally is a Latin phrase, and must be grammatically correct Latin. If the second part, the specific name or the third part, the subspecific name is adjectival in nature, its ending must agree in gender with the name of the genus. If it is a noun, or an arbitrary combination of letters, this does not apply.

For instance, the generic name *Equus* is masculine; in the name *Equus africanus* the specific name *africanus* is an adjective and its ending follows the gender of the generic name. In *Equus zebra* the specific name *zebra* is a noun, it is not correct to write *Equus zebrus*. Similarly in *Equus quagga burchellii* the subspecific name *burchellii* is a noun in the genitive of the esteemed Burchell. If a species is moved, therefore, the spelling of an ending may need to be changed. Confusion over proper Latin grammar has led to many incorrectly-formed names appearing in print. An improper automated search may fail to find all the variant spellings of a given name (e.g., the spellings *atra* and *ater* may refer to the same species). Accordingly, many laymen and some scientists object to continued adherence to this long-standing rule.

Commission

The rules in the Code are to be followed by all users of Zoological names. However, its provisions can be interpreted, waived or modified in their application to a particular case when strict adherence would cause confusion. Such exceptions are not made by an individual scientist, no matter how well-respected within his or her field, but only by the International Commission on Zoological Nomenclature, acting on behalf of all Zoologists. The Commission takes such action in response to proposals submitted to it. For example:

Carolus Linnaeus named the Domestic Cat, *Felis catus* in 1758; Johann Christian Daniel von Schreber named the Wildcat *Felis silvestris* in 1775. For taxonomists who consider these two kinds of cat to be a single species, the Principle of Priority applies which means that the species ought to be named *F. catus*, but in practice almost all biologists have used *F. silvestris*. In 2003, the Commission issued a ruling (Opinion 2027) that "conserved the usage of 17 specific names based on wild species, which are predated by or contemporary with those based on domestic forms", confirming *F. silvestris*

for the wild cat. Taxonomists who consider the domesticated cat to be the same species as the wild cat should use *F. silvestris*; taxonomists who consider the domesticated cat a subspecies of the wild cat should use *F. silvestris catus*; taxonomists who consider the domesticated cat a separate species should use *F. catus*.

Principles

i) Principle of Binominal Nomenclature

In Zoology, the Principle of Binominal Nomenclature is one of the guiding principles of the *International Code of Zoological Nomenclature*. It states that the system of nomenclature for animals is binominal nomenclature: species have a name composed of two names, a "binomen": a generic name and a specific name. No other rank can have a name composed of two names. For example *Giraffa camelopardalis*; subspecies have a name composed of three names, a "trinomen": generic name, specific name, subspecific name:

Giraffa camelopardalis rothschildi taxa at a rank above species have a name composed of one name, a "uninominal name" i.e. *Giraffa* or *Giraffidae*. In botanical nomenclature, the equivalent for "binominal nomenclature" is "binary nomenclature" (or sometimes "binomial nomenclature").

ii) Principle of Coordination

In Zoology, the Principle of Coordination is one of the important principles of the *International Code of Zoological Nomenclature*. It states that the act of publishing a new Zoological name thereby automatically and simultaneously establishes all the corresponding names in the relevant other ranks, with the same type. For example

In the species-group, publishing the species name (the binomen) *Giraffa camelopardalis* Linnaeus, 1758 also establishes the subspecies name (the trinomen) *Giraffa camelopardalis camelopardalis* Linnaeus, 1758. The same applies to the name of a subspecies; this establishes the corresponding species name. In the genus-group, similarly, publishing the name of a genus also establishes the corresponding name of a subgenus (or vice versa): *Giraffa* Linnaeus, 1758 and *Giraffa* Linnaeus, 1758. In the family-group, publication of the name of a family, subfamily, superfamily (or any other such rank) also establishes the names in all the other ranks in the family group. Author citations for such names are the same as for the name actually published. It is immaterial if there is an actual taxon to which the automatically established name applies; if ever such a taxon is recognised, there is a name available for it.

iii) Principle of the First Reviser

In Zoology, the Principle of the First Reviser is one of the guiding principles of the *International Code of Zoological Nomenclature*. It supplements the Principle of Priority, which states that the first published name takes precedence. The Principle of the First Reviser deals with situations that cannot be resolved by priority, namely where there are two or more items that have the same date of publication (or the same year of

publication when no details are known). These items may be two or more different names for the same taxon, two or more names with the same spelling used for different taxa, two or more different spellings of a particular name, etc. In such cases the first subsequent author who deals with the matter, makes a choice and publishes the decision in the required manner, the First Reviser, is to be followed. [Art. 24.2].

iv) Principle of Homonymy

In Zoology, the Principle of Homonymy is one of the guiding principles of the *International Code of Zoological Nomenclature*. It states that any one name, in one particular spelling, may be used only once (within its group). This will be the first-published name; any later name with the same spelling (a homonym) is barred from being used. The Principles of Priority and the First Reviser apply here. For family-group names the termination (which is rank-bound) is not taken into account. In 1777 Johann Reinhold Forster published the name *Echidna* for a genus of moray eels. This meant that when Georges Cuvier proposed to use this name *Echidna* in 1797 for the spiny anteater he created a junior homonym. Later, in 1811, Johann Karl Wilhelm Illiger published the name *Tachyglossus*, as a replacement name, or *nomen novum*, and this is considered to be the valid name for the spiny anteater.

v) Principle of Priority

In Zoology, the scientific study of animals, the Principle of Priority is one of the guiding principles of the *International Code of Zoological Nomenclature*, defined by Article 23. It states that the correct formal scientific name for an animal taxon, the name that is to be used, called the valid name, is the oldest available name that applies to it. There are exceptions; another name may be given precedence by any provision of the Code or by any ruling of the Commission. It is the fundamental guiding precept that preserves the stability of Zoological nomenclature. It was first formulated in 1842 by a committee appointed by the British Association to consider the rules of Zoological nomenclature; the committee's report was written by Hugh Edwin Strickland. In 1855, John Edward Gray published the name *Antilocapra anteflexa* for a new species of pronghorn, based on a pair of horns. However, it is now thought that his specimen belonged to an unusual individual of an existing species, *Antilocapra americana*, with a name published by George Ord in 1815. The older name, by Ord, takes priority; with *Antilocapra anteflexa* becoming a junior synonym. In 1856, Johann Jakob Kaup published the name *Leptocephalus brevirostris* for a new species of eel. However, it was realized in 1893 that the organism described by Kaup was in fact the juvenile form of the European eel. The European eel was named *Muraena anguilla* by Carolus Linnaeus in 1758 and moved to the genus *Anguilla* by Franz Paula von Schrank in 1798. So *Anguilla anguilla* is now the valid name for the species, and *Leptocephalus brevirostris* is considered a junior synonym.

The Common Chimpanzee was named *Simia troglodytes* by Johann Friedrich Blumenbach; when Lorenz Oken moved it to the new genus *Pan* in 1816, the specific name *troglodytes* had priority over any newly to be coined specific name, so the valid name is now *Pan troglodytes* (Blumenbach, 1775). Two species of Madagascar snake

were initially given the names *Pelophilus madagascariensis* Duméril & Bibron, 1844 and *Xiphosoma madagascariensis* Duméril & Bibron, 1844. The former was moved to the genus *Boa* in 1893 by George Albert Boulenger, resulting in the name *Boa madagascariensis* (Duméril & Bibron, 1844). This meant that when in 1991 Arnold G. Kluge of the Museum of Zoology at the University of Michigan moved *Xiphosoma madagascariensis* to the genus *Boa* as well, it could not have the name *Boa madagascariensis*. So Kluge gave the species the name *Boa manditra*.

vi) Principle of Typification

In Zoology, the Principle of Typification is one of the guiding principles of the *International Code of Zoological Nomenclature*. It states that any named taxon, in the family group, genus group or species group, has or should have a name-bearing type which allows the application of the name of the taxon to be objectively applied. The type does not define the taxon; this is done by a taxonomist, and an indefinite number of competing definitions can exist, side by side. Rather, a type is a point of reference; a name has a type, and a taxonomist having defined his taxon, can make inventory with existing types fall within the scope of his taxon. He or she can then use the rules in the Code to determine the valid name for the taxon.

Preamble

The International Code of Zoological Nomenclature is the system of rules and recommendations originally adopted by the International Congresses of Zoology and, since 1973, by the International Union of Biological Sciences (IUBS). The objects of the Code are to promote stability and universality in the scientific names of animals and to ensure that the name of each taxon is unique and distinct. All its provisions and recommendations are subservient to those ends and none restricts the freedom of taxonomic thought or actions. Priority of publication is a basic principle of Zoological nomenclature; however, under conditions prescribed in the Code its application may be modified to conserve a long-accepted name in its accustomed meaning. When stability of nomenclature is threatened in an individual case, the strict application of the Code may under specified conditions be suspended by the International Commission on Zoological Nomenclature. Precision and consistency in the use of terms are essential to a code of nomenclature. The meanings given to terms used in this Code are those shown in the Glossary. Both this Preamble and the Glossary are integral parts of the Code's provisions. The International Commission on Zoological Nomenclature is the author of the Code.

In Zoological nomenclature, the valid name of a taxon is the Zoological name that is to be used for that taxon following the rules in the International Code of Zoological Nomenclature (ICZN). In other words, a valid name is the correct Zoological name of a taxon while an invalid name is a name that violates the rules of the ICZN. An invalid name is not considered to be a correct scientific name for a taxon and are divided into:

- **Subjectively invalid names** - Names that have been rendered invalid by individual scientific judgement or opinion. Taxonomists may differ in their opinion and names considered invalid by one researcher, can be accepted as valid by another; thus they are still potentially valid names. It includes:
 - **Junior subjective synonyms** - synonyms described from different types previously described as separate taxa.
 - **Junior secondary homonyms** - species synonyms arising from merging two taxonomic groups previously considered separate. In this case, the taxa are separate species, but by chance, had the same specific name resulting in homonymy when their generic names are synonymized.
 - **Conditionally suppressed names** - are special cases where a name which would otherwise have been valid has been petitioned for suppression by the International Commission on Zoological Nomenclature. This is usually because the junior synonym (the later name) has wider common usage than the senior synonym (the older name).
- **Objectively invalid names** - Names that have been rendered invalid for factual reasons. These names are universally accepted as invalid and not merely a matter of individual opinion as is the case with subjectively invalid names. It includes:
 - **Junior objective synonyms** - names describing a taxon (the junior synonym) that have already been described by another name earlier (the senior synonym). ICZN follows the Principle of Priority, in which the oldest available name is applied in preference to newer names where possible.
 - **Junior homonyms** in the family and genus group - names of families and genera which have the same spelling but refer to different taxa.
 - **Junior primary homonyms** in a species group - species synonyms resulting from two different organisms being originally described with the same name spelled in the same way. Compare with the previously discussed junior secondary homonyms.
 - **Completely suppressed names** - are special cases where a name is completely suppressed by the International Commission of Zoological Nomenclature. It is treated as if it had never been published and is never to be used, regardless of actual availability.
 - **Partially suppressed names** - are special cases where a name is partially suppressed by the International Commission on Zoological Nomenclature. Unlike completely suppressed names, partially suppressed names are still acknowledged as having been published but is used only for the purpose of homonymy, not priority.

Contrast to botany

Under the International Code of Nomenclature for algae, fungi, and plants, the term validly published name has a different meaning that corresponds to Zoology's available name. The botanical equivalent of Zoological term "valid name" is correct name.

B) HOMONYMY

This basic principle refers to the application of the same name to different taxa. The codes of nomenclature state that no two names above the species-group level may be the same in Zoology or Botany, although names may be duplicated between the two fields. Homonyms are of different types:

Senior homonyms: The available name on the basis of priority that is as per the year of publication.

Junior homonyms: A preoccupied name (not in use) on the basis of priority or by a ruling by a nomenclatorial body.

Primary homonyms: In a species-group (species, subspecies, etc.) these are names that are the same and were proposed in the same genus-group taxon. The junior homonym must always be replaced either by a new name or a junior synonym (if one exists). Example: *Cottus pygmaeus* & pygmy sculpin. This species was described and later it was discovered that this name was already preoccupied by an old description of a *Cottus* from the Old World which means it is a primary homonym. A new name for the pygmy sculpin is currently being described.

Secondary Homonyms: These are species that are placed in the same genus subsequent to their publication and they have the same specific epithets. The senior secondary homonym is the older of the two names. An alternative name will have to be provided either through description or junior synonyms for the junior homonym.

Example:

***Cyprinella garmani* (Jordan)
gibbous shiner**

Notropis garmani Jordan, 1885 [Substitute name for preoccupied *rubripinna* Garman, 1881]

Cyprinella rubripinna Garman, 1881 [Original description; Type locality: Lago del Muerto, near Parras, Coahuila, Mexico].

Articles 52 – 60 deals with homonymy

Article 52. Homonymy

Identity in the spelling of names denoting species group taxa, genus group or within the family group taxa.

Article 53. Law of homonymy

Junior homonym of an available name to be rejected and replaced

Article 54. Names that do not enter into homonymy

- i. Names that are unavailable in the meaning of the code
- ii. Names that have never been used for a taxon in the animal kingdom
- iii. Names that are excluded from Zoological nomenclature viz. Subgenus and Infrasubspecies
- iv. Incorrect spellings, both original and subsequent

Article 55. Family group names

- a) Two generic names, *Merope* (Insecta) and *Merops* (Aves), each resulted in the family name Meropidae. To avoid the homonymy, the commission ruled the *Merope* should form the family name Meropeidae.
- b) Homonymy from incorrect spelling is not to be rejected e.g. Psilopinae Cresson, 1925 based on *Psilopa* Fallen, is not to be rejected as a homonymy of Psilopinae Schiner, 1868 which was based on *Psilopus* Meigen and should have been written as Psilopodinae.

Article 56. Genus group names**a) One letter difference**

Two genera of Diptera, *Microchaetina* Wulp, 1891 and *Microchaetona* Townsend, 1919 are not homonyms

- b) **Name endings in -ites, -ytes, or -ithes given to fossils** e.g. generic names *Pectinites* and *Tellinites* Schlotheim, 1813 given to fossil shells were thought to belong to recent genera *Pecten* Muller, 1767 and *Tellina* Linnaeus, 1758 are available only for the purpose of law of homonymy.

c) Precedence of genus over subgenus:

Of the two homonymous genus group names of identical dates, one proposed for a genus takes precedence over the one proposed for a subgenus.

Article 57. Species group names: the law of homonymy applies to species group names which are originally published in or later brought together in the same genus e.g.,

A-us intermedius Pavlov

A-us intermedius Dupont

A-us albus intermedius LBlack

A-us concolor intermedius Schmidt

- a) **Subgeneric names.** The presence of subgeneric names does not affect homonymy between species group names within the same genus
- b) **Differences in spellings**
- c) **Precedence of species over subspecies**

Article 58. Variable spellings

Following with only variable difference are considered homonyms:

- a) Use of **ae, oe or e** e.g. *caeruleus*, *coeruleus* and *ceruleus*
- b) Use of **ei, i, y** eg., *cheiropus*, *chiropus*, *chyropus*
- c) Use of **c or k** e.g., *microdon*, *mikrodon*
- d) Use of single or double consonants e.g., *littoralis* and *litoralis*
- e) Presence of **c** before **t** e.g., *auctumnalis* and *autumnalis*
- f) Use of **f** or **ph** eg., *sulphureus* and *sulfurous*

Article 59. Concerns with primary and secondary homonymy**Article 60. Replacement of rejected names**

- a) A rejected homonym must be replaced by an existing available name or for the lack of such a name by a new name
- b) If the junior homonym has one or more available synonyms, the oldest of these synonyms with its own authorship and date must be adapted.

C) SYNONYMY

In scientific nomenclature, a **synonym** is a scientific name that applies to a taxon that goes by a different scientific name, although Zoologists use the term somewhat differently. For example, Linnaeus was the first to give a scientific name (under the currently used system of scientific nomenclature) to the Norway spruce, which he called *Pinus abies*. This name is no longer in use: it is now a synonym of the current scientific name which is *Picea abies*.

Unlike synonyms in other contexts, in taxonomy a synonym is not interchangeable with the name of which it is a synonym. In taxonomy, synonyms are not equals, but have a different status. For any taxon with a particular circumscription, position, and rank, only one scientific name is considered to be the correct one at any given time (this correct name is to be determined by applying the relevant code of nomenclature). A synonym is always the synonym of a different scientific name and cannot exist in isolation. Given that the correct name of a taxon depends on the taxonomic viewpoint used (resulting in a particular circumscription, position and rank) a name that is one taxonomist's synonym may be another taxonomist's correct name (and *vice versa*). Synonyms may arise whenever the same taxon is described and named more than once, independently. They may also arise when existing taxa are changed, as when two taxa are joined to become one, a species is moved to a different genus, a variety is moved to a different species, etc.

To the general user of scientific names, in fields such as agriculture, horticulture, ecology, general science, etc., a synonym is a name that was previously used as the correct scientific name (in handbooks and similar sources) but which has been displaced by another scientific name, which is now regarded as correct. Thus Oxford Dictionaries Online defines the term as "a taxonomic name which has the same application as another, especially one which has been superseded and is no longer valid." In handbooks and general texts, it is useful to have synonyms mentioned as such after the current scientific name, so as to avoid confusion. For example, if the much advertised name change should go through and the scientific name of the fruit fly were changed to *Sophophora melanogaster*, it would be very helpful if any mention of this name was accompanied by "(syn. *Drosophila melanogaster*)". Or to give another example, a mention of the name *Apatosaurus* is much helped by the addition "(syn. *Brontosaurus*)". Synonyms used in this way may not always meet the strict definitions of the term "synonym" in the formal rules of nomenclature which govern scientific names .

Changes of scientific name have two causes: they may be taxonomic or nomenclatural. A name change may be caused by changes in the circumscription, position or rank of a taxon, representing a change in taxonomic, scientific insight (as would be the case for the fruit fly, mentioned above). A name change may be due to purely nomenclatural reasons, that is, based on the rules of nomenclature; as for example when an older name is (re)discovered which has priority over the current name. Speaking in general, name changes for nomenclatural reasons have become less frequent over time as the rules of nomenclature allow for names to be conserved, so as to promote stability of scientific names.



The Latin *Caudata* and Greek *Urodela* both mean "tailed" and have been used as a scientific name at the rank of order for the salamanders (as opposed to the tail-less frogs). Thus they are synonyms.

In Zoological nomenclature, codified in the *International Code of Zoological Nomenclature*, synonyms are different scientific names of the same rank that pertain to the same taxon, for example two names for the same species. The earliest such name is called the **senior synonym**, while the later name is the **junior synonym**. One basic principle of Zoological nomenclature is that the earliest correctly published (and thus available) name, the senior synonym, takes precedence and must be used for the taxon, if no other restrictions interfere. Synonyms are important because if the earliest name cannot be used (for example because the same spelling had previously been used for a name established for another taxon), then the next available junior synonym must be used for the taxon.

Objective synonyms refer to taxa with the same type and same rank (more or less the same taxon, although circumscription may vary, even widely). This may be species-group taxa of the same rank with the same type specimen, genus-group taxa of the same rank with the same type species or if their type species are themselves objective synonyms, of family-group taxa with the same type genus, etc. In the case of **subjective synonyms** there is no such shared type, so the synonymy is open to taxonomic judgement, meaning that there is room for debate: one researcher might consider the two (or more) types to refer to one and the same taxon, another might consider them to belong to different taxa. For example, John Edward Gray published the name *Antilocapra anteflexa* in 1855 for a species of pronghorn, based on a pair of horns. However, it is now commonly accepted that his specimen was an unusual individual of the species *Antilocapra americana* published by George Ord in 1815. Ord's name thus takes precedence, with *Antilocapra anteflexa* being a junior subjective synonym.

Objective synonyms are common at the level of genera, because for various reasons two genera may contain the same type species; these are objective synonyms. In many cases researchers established new generic names because they thought this was necessary or did not know that others had previously established another genus for the same group of species. An example is the genus *Pomatia* Beck, 1837, which was established for a group of terrestrial snails containing as its type species the Burgundy or Roman snail *Helix pomatia* – since *Helix pomatia* was already the type species for the

genus *Helix* Linnaeus, 1758, the genus *Pomatia* was an objective synonym (and useless). At the same occasion *Helix* is also a synonym of *Pomatia*, but it is older and so it has precedence. At the species level, subjective synonyms are common because of an unexpectedly large range of variation in a species, or simple ignorance about an earlier description, may lead a biologist to describe a newly discovered specimen as a new species. A common reason for objective synonyms at this level is the creation of a replacement name.

It is possible for a junior synonym to be given precedence over a senior synonym, primarily when the senior name has not been used since 1899, and the junior name is in common use. The older name may be declared to be a *nomen oblitum*, and the junior name declared a *nomen protectum*. This rule exists primarily to prevent the confusion that would result if a well-known name, with a large accompanying body of literature, were to be replaced by a completely unfamiliar name. An example is the European land snail *Petasina edentula* (Draparnaud, 1805). In 2002, researchers found that an older name *Helix depilata* Draparnaud, 1801 referred to the same species, but this name had never been used after 1899 and was fixed as a *nomen oblitum* under this rule by Falkner *et al.* 2002. Such a reversal of precedence is also possible if the senior synonym was established after 1900, but only if the International Commission on Zoological Nomenclature (ICZN) approves an application. For example, the scientific name of the red imported fire ant, *Solenopsis invicta* was published by Buren in 1972, who did not know that this species was first named *Solenopsis saevissima wagneri* by Santschi in 1916; as there were thousands of publications using the name *invicta* before anyone discovered the synonymy, the ICZN, in 2001, ruled that *invicta* would be given precedence over *wagneri*.

To qualify as a synonym in zoology, a name must be properly published in accordance with the rules. Manuscript names and names that were mentioned without any description (*nomina nuda*) are not considered as synonyms in zoological nomenclature. In botanical nomenclature, a synonym is a name that is not correct for the circumscription, position, and rank of the taxon as considered in the particular botanical publication. It is always "a synonym of the correct scientific name", but which name is correct depends on the taxonomic opinion of the author. In botany the various kinds of synonyms are:

- Homotypic, or nomenclatural, synonyms (sometimes indicated by \equiv) have the same type (specimen) and the same taxonomic rank. The Linnaean name *Pinus abies* L. has the same type as *Picea abies* (L.) H.Karst. When *Picea* is taken to be the correct genus for this species (there is almost complete consensus on that), *Pinus abies* is a homotypic synonym of *Picea abies*. However, if the species were considered to belong to *Pinus* (now unlikely) the relationship would be reversed and *Picea abies* would become a homotypic synonym of *Pinus abies*. A homotypic synonym need not share an epithet or name with the correct name; what matters is that it shares the type. For example, the name *Taraxacum officinale* for a species of dandelion has the same type as *Leontodon taraxacum* L. The latter is a homotypic synonym of *Taraxacum officinale* Wigg.

- Heterotypic, or taxonomic, synonyms (sometimes indicated by =) have different types. Some botanists split the common dandelion into many, quite restricted species. The name of each such species has its own type. When the common dandelion is regarded as including all those small species, the names of all those species are heterotypic synonyms of *Taraxacum officinale* Wigg. Reducing a taxon to a heterotypic synonym is termed "to sink in synonymy" or "as synonym". In botany, although a synonym must be a formally accepted scientific name (a validly published name): a listing of "synonyms", a "synonymy", often contains designations that for some reason did not make it as a formal name, such as manuscript names, or even misidentifications (although it is now the usual practice to list misidentifications separately).

Comparison between Zoology and Botany

Although the basic principles are fairly similar, the treatment of synonyms in botanical nomenclature differs in detail and terminology from zoological nomenclature, where the correct name is included among synonyms, although as first among equals it is the "senior synonym":

- Synonyms in Botany are comparable to "junior synonyms" in Zoology.
- The homotypic or nomenclatural synonyms in Botany are comparable to "objective synonyms" in Zoology.
- The heterotypic or taxonomic synonyms in Botany are comparable to "subjective synonyms" in Zoology.

Synonym lists

Scientific papers may include lists of taxa, synonymizing existing taxa and (in some cases) listing references to them. The status of a synonym may be indicated by symbols, as for instance in a system proposed for use in palaeontology by Rudolf Richter. In that system a before the year would indicate that the authors have inspected the original material; a that they take on the responsibility for the act of synonymizing the taxa.

Other usage

The traditional concept of synonymy is often expanded in taxonomic literature to include "pro parte" (or "for part") synonyms. These are caused by splits and circumscriptional changes. They are usually indicated by the abbreviation "p.p." For example:

- When Dandy described *Galium tricornutum*, he cited *G. tricornis* Stokes (1787) pro parte as a synonym, but explicitly excluded the type (specimen) of *G. tricornis* from the new species *G. tricornutum*. Thus *G. tricornis* was subdivided.

The Angiosperm Phylogeny Group's summary of plant classification states that family Verbenaceae "are much reduced compared to a decade or so ago, and many genera have been placed in Lamiaceae", but *Avicennia*, which was once included in Verbenaceae has been moved to Acanthaceae. Thus, it could be said that Verbenaceae pro parte is a synonym of Acanthaceae, and Verbenaceae pro parte is also a synonym of Lamiaceae. However, this terminology is rarely used because it is clearer to reserve the

term "pro parte" for situations that divide a taxon that includes the type from one that does not.

D) LAW OF PRIORITY

Linnaeus (1753)

Article-23. According to the rule, the valid name of a taxon is the oldest available name applied to it, provided that the name is not invalidated by any provisions of this code or has not been suppressed by the commission.

"Priority" means Priority of publication e.g;

Epitranus erythrogaster, an insect species described by Cameron, 1888 and the same species was described by several authors-

1. *Epitranus erythrogaster* Cameron, 1888
2. *Anacryptus sculpturatus* Crawford, 1910
3. *Anacryptus kankauensis* Masi, 1933
4. *Arrectoceroides ceylonensis* Mani, 1936

Since the Camerons' name *E. erythrogaster* is the earliest legitimate name, therefore, it is accepted as a valid name (senior synonym) and rest of the names according to law of priority becomes its invalid names (Jr. syn.)

(a) Exceptions:

A name that is not the oldest available name is nevertheless the valid name of the taxon in question

- (i) If it is conserved under section (b) of this article; or
- (ii) If the commission has expressly validated it.

(b) Limitations:

A name that has remained unused as a senior synonym in the primary Zoological literature for more than 50 years is to be considered a forgotten name (*Nomen oblitum*).

(c) Family Group Names:

A family group taxon formed by the union of two or more taxa of that group takes the oldest valid family group name among those of its components.

(d) Genus and Species Group Names:

- (i) A genus-group taxon formed by the union of two or more genus group taxa takes the oldest valid name among those of its components e.g., The valid name of a genus formed by the union of genus A-us, 1850, and subgenus B-us, 1800, is B-us, 1800.
- (ii) A species group taxon formed by the union of two or more species group taxa takes the oldest valid name among those of its components.
- (iii) If the name of a genus or species having subordinate taxa is found to be invalid or unavailable, it must be replaced by the next oldest valid name e.g., Genus A-us, 1850, contains the subgenera A-us, 1850, C-us, 1900, and D-us, 1860. If the name A-us is found to be a junior homonym, it is to be replaced as the name of the genus by D-us, 1860, the next oldest valid name

Genus-1

Genus-2

Genus A-us, 1850	A-us, 1845
Genus A-us, 1850	A-us, 1845
Genus C-us, 1900	B-us, 1850
Genus D-us, 1860	C-us, 1855

Therefore genus A-us is to be replaced by D-us, 1860 (next oldest-available name) and the order of it will be-

- Genus D-us, 1860
- Subgenus D-us, 1860
- Subgenus C-us, 1900
- Subgenus A-us, 1850

Article-24 – Interpretation of Oldest Name

- (a) Names published simultaneously-** If more than one name for a single taxon, or identical names for different taxa, is published simultaneously, whether in the same or different works, the relative priority is determined by the action of the first reviser.

Recommendation-24A- Action of first reviser

In acting as first reviser, a zoologist should select the name that will best ensure stability and universality of nomenclature.

- (b) Names founded on any part or form of an animal or on its work.** The law of priority applies-
