VIDYASAGAR UNIVERSITY

Lecture for 2nd Semester

(BOT 201-Unit-I) : Angiosperms Taxonomy

4. BioCode or PhyloCode

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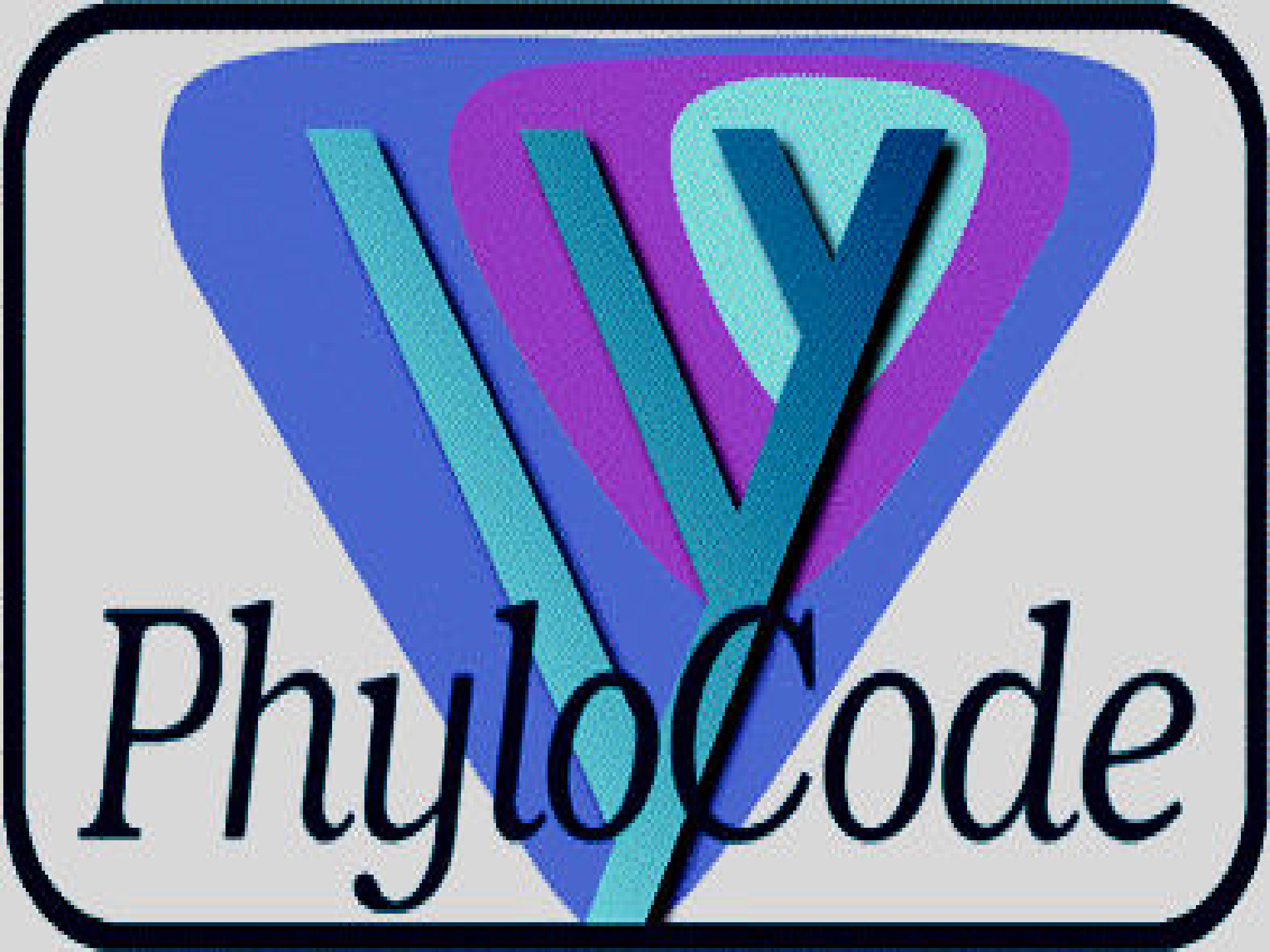

PhyloCode

PhyloCode *(Noun)*

A draft Code of formal nomenclature intended to allow naming phylogenetic groups, of all living things, rather than taxonomic groups (taxa). Officially, such names are intended to supplement scientific names rather than replace them.

PhyloCode

- The International Code of Phylogenetic Nomenclature, known as the PhyloCode for short, is a developing draft for a formal set of rules governing phylogenetic nomenclature.

- Its current version is specifically designed to regulate the naming of clades, leaving the governance of species names up to the rank-based Nomenclature codes.

- The PhyloCode is associated with the International Society for Phylogenetic Nomenclature.

A draft Code of formal nomenclature intended to allow naming phylogenetic groups, of all living things, rather than taxonomic groups (taxa). Officially, such names are intended to supplement scientific names rather than replace them.

Introduction

- Biology requires a precise, coherent, international system for naming clades and species of organisms.

- The PhyloCode attempts to satisfy this need by providing rules for naming clades and species and describing the nomenclatural principles that form the basis for those rules.

- The PhyloCode is applicable to the names of all clades and species of organisms, whether extant or extinct.

- The PhyloCode may be used concurrently with the pre-existing codes.

- Although the PhyloCode relies on the pre-existing codes:
- *International Code of Botanical Nomenclature (ICBN),*
- *International Code of Zoological Nomenclature (ICZN),*
- *International Code of Nomenclature of Bacteria: Bacteriological Code (BC),*
- *International Code of Virus Classification and Nomenclature (ICVCN) to determine the acceptability of pre-existing names,* it governs the application of those names independently from the pre-existing codes.

- The PhyloCode includes rules, recommendations, and notes.
- Rules are mandatory.
- Recommendations are not mandatory, but systematists are encouraged to follow them.
- Notes are intended solely for clarification.
- The PhyloCode will take effect on 1 January 200n and is not retroactive.

METHODS OF NAMING IN THE PHYLOCODE

The PhyloCode proposes a registration system whereby clade names are submitted electronically. The following information is needed:

1) DEFINITION TYPE: node- stem- or apomorphy-based (mandatory)

2) PHYLOGENETIC DEFINITION: (mandatory)

3) LIST OF SPECIFIERS: (at least 2 mandatory)

4) QUALIFYING CLAUSE

5) REFERENCE PHYLOGENY: bibliographic reference, URL, or accession no. in public repository

Principles

1. **Reference**: The primary purpose of taxon names is to provide a means of referring to taxa, as opposed to indicating their characters, relationships, or membership.
2. **Clarity**: Taxon names should be unambiguous in their designation of particular taxa. Nomenclatural clarity is achieved through explicit definitions, which describe the concept of the taxon designated by the defined name.

3. Uniqueness: To promote clarity, each taxon should have only one accepted name, and each accepted name should refer to only one taxon.

4. Stability: The names of taxa should not change over time. As a corollary, it must be possible to name newly discovered taxa without changing the names of previously discovered taxa.

5. Phylogenetic context: The PhyloCode is concerned with the naming of taxa and the application of taxon names in the context of phylogenetic concepts of taxa.

6. The PhyloCode permits The PhyloCode permits freedom of taxonomic opinion with regard to hypotheses about relationships; it only concerns how names are to be applied within the context of a given phylogenetic hypothesis.

7. There is no "case law" under this code. Nomenclatural problems are resolved by the Committee on Phylogenetic Nomenclature (CPN) by direct application of the code; previous decisions will be considered, but the CPN is not obligated by precedents set in those decisions.

Rules

Chapter I. Taxa

Article 1.

1. The Nature of Taxa

1.1. The groups of organisms whose names are governed by this code are called taxa (singular: taxon).
Taxa may be clades or species, but only clade names are governed by this code.

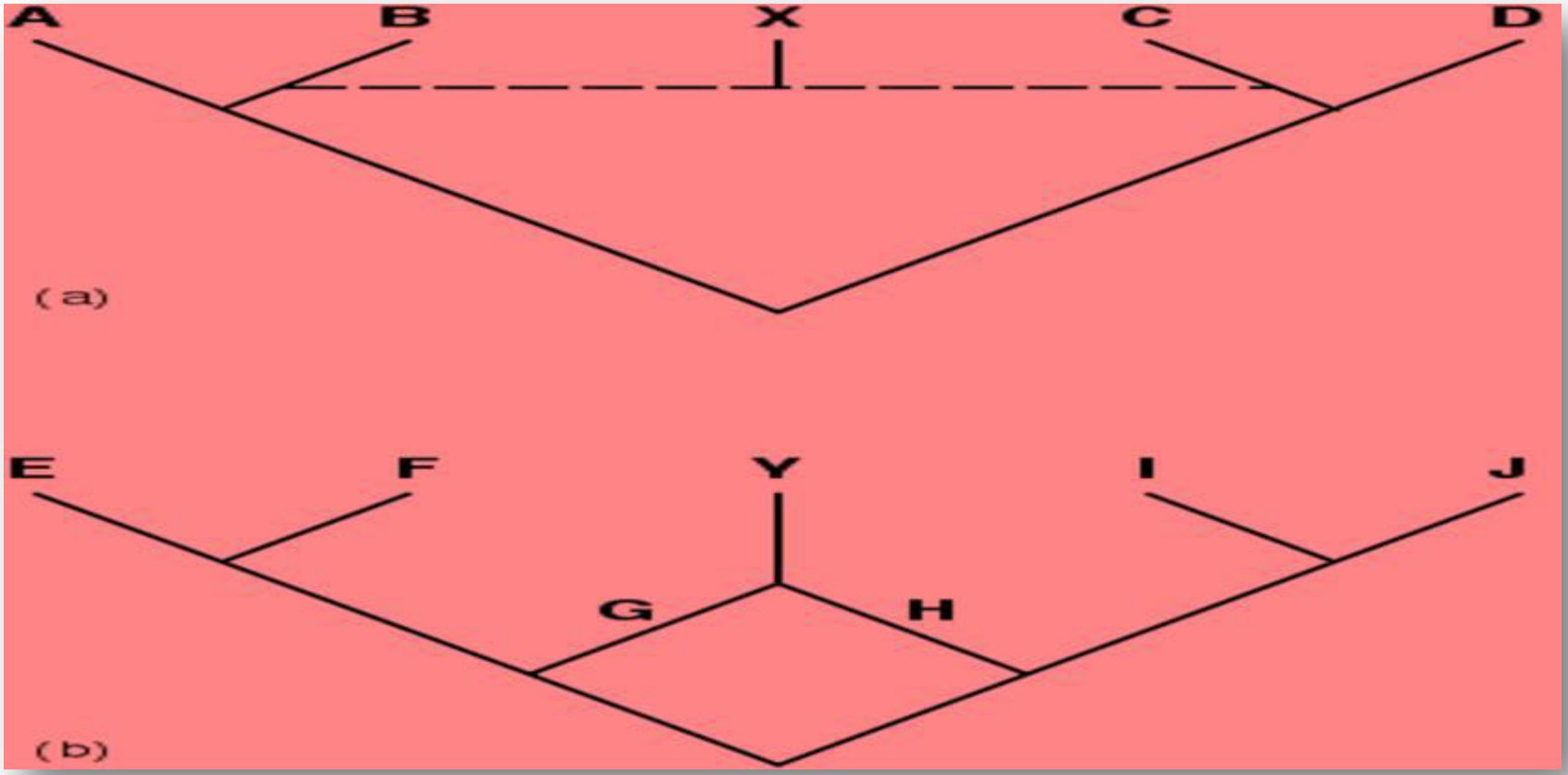
Article 2. Clades

2.1. In this code, a clade is an ancestor (an organism, population, or species) and all of its descendants.

Note 2.1.1. Every individual organism belongs to at least one clade (i.e., the clade comprising all of life). Each organism also belongs to a number of nested clades (though the ancestor of the clade comprising all life does not belong to any other clade).

Note 2.1.2. It is not necessary that all clades be named.

Note 2.1.3. Clades are often either nested or mutually exclusive; however, phenomena such as speciation via hybridization, species fusion, and endosymbiosis can result in clades that are partially overlapping (see Figure in the next slide).



Speciation via hybridization (a) and species fusion (b) can result in clades that are partially overlapping. In (a), the origin of species X via hybridization (represented by the dashed line) between members of species B and C results in partial overlap between the most inclusive clade containing A but not D (or the least inclusive clade containing both A and B), which is composed of A, B and X, and the most inclusive clade containing D but not A (or the least inclusive clade containing C and D), which is composed of C, D, and X, in that X is part of both clades. In (b), fusion of species G and H to form species Y (with the two parent species disappearing in the process) results in partial overlap between the most inclusive clade containing E but not J (or the least inclusive clade containing both E and G), which is composed of E, F, G, and Y, and the most inclusive clade containing J but not E (or the least inclusive clade containing both H and J), which is composed of H, I, J, and Y, in that Y is part of both clades.

Article 3. Hierarchy and Rank

3.1. The system of nomenclature described in this code is independent of rank.

Although clades are hierarchically related, assignment of a categorical rank (e.g., genus, family, etc.) is not part of the formal naming process and has no bearing on the spelling or application of taxon names.

Example 1. If the name *Iguanidae were defined as referring to a clade originally ranked as a* family, and if that clade were later ranked as a subfamily and (at the same time) a more inclusive clade ranked as a family, the reference of the name *Iguanidae would not change to the more* inclusive clade, nor would the spelling of that name change (i.e., to *Iguaninae) to reflect the new* rank of the clade to which it refers.

Note 3.1.1. In this code, the terms "species" and "clade" refer to different kinds of biological entities, not ranks.

3.2. The concepts of synonymy, homonymy, and precedence adopted in this code (see Arts. 12–14) are, in contrast to the preexisting codes, independent of categorical rank.

Chapter II. Publication

Article 4. Publication Requirements

4.1. The provisions of this article apply not only to the publication of names, but also to the publication of any nomenclatural act (e.g., a proposal to conserve a name).
4.2. Publication, under this code, is defined as distribution of text (but not sound), with or without images, in a peer-reviewed book or periodical. To qualify as published, works must consist of numerous (at least 50 copies), simultaneously obtainable, identical, durable, and unalterable copies, some of which are distributed to major institutional libraries in the field so that the work is generally accessible as a permanent public record to the scientific community, be it through sale or exchange or gift, and subject to the restrictions and qualifications in the present article.

Note 4.2.1. If an entire book is not peer-reviewed or a periodical is not consistently peerreviewed, the article or chapter in which a name or nomenclatural act appears must be peerreviewed in order to qualify as published.

Note 4.2.2. Approval of a work by a thesis or dissertation committee does not constitute peer review.

4.3. The following do not qualify as publication:

(a) dissemination of text or images solely through electronic communication networks (such as the Internet) or through storage media (such as CDs, diskettes, film, microfilm and microfiche) that require a special device to read.

(b) theses and dissertations;
(c) abstracts of articles, papers, posters, texts of lectures, and similar material presented at meetings, symposia, colloquia or congresses, even if the abstract is published in a peer-reviewed journal;
(d) the placing of texts or images in collections or exhibits, for example, on labels (including specimen labels, even if printed) or information sheets;
(e) the reproduction of hand-written material in facsimile, for example, by photocopy;
(f) patents and patent applications;
(g) newspapers and periodicals intended mainly for people who are not professional biologists, abstracting journals, trade catalogues, and seed exchange lists;
(h) anonymous works. See also Art. 7.3.

Note 4.3.1. If a name is disseminated through electronic publication (see Art. 4.3a), it must also satisfy the requirements in Article 4.2.

Article 5. Publication Date

5.1. The publication date is the date on which publication, as defined in Article 4, took place. More specifically, it is the date on which the publisher or publisher's agent delivered the printed matter to a carrier for distribution to the public. In the absence of proof establishing some other date, the one appearing in the publication itself must be accepted as correct.

5.2. When separates are issued in advance of the work (periodical or book) that contains them, the date of the work, not of the separate, constitutes the date of publication.

Chapter III. Names
Section 1. Status
Article 6

6.1. Established names are those that are published in accordance with Article 7 of this code.

Unless a name is established, it has no status under this code.

Recommendation 6.1A. In order to distinguish scientific names from other (e.g., vernacular) names, all scientific names should be italicized when they appear in print.

Note 6.1A.1. Italicizing all scientific names is consistent with the 2000 edition of the ICBN but not with the 1999 edition of the ICZN.

Recommendation 6.1B.

In order to indicate which names are established under this code and therefore have explicit phylogenetic definitions (and whose endings are not reflective of rank), it may be desirable to distinguish these names from supraspecific names governed by preexisting codes, particularly when both are used in the same publication.

Example 1. The letter "P" (bracketed or in superscript) might be used to designate names governed by the PhyloCode, and the letter "R" to designate names governed by the preexisting rank-based codes. Using this convention, the name "*Ajugoideae[R]" would apply to a plant* subfamily which may or may not be a clade, whereas "*Teucrioideae[P]" would apply to a clade* which may or may not be a subfamily.

Example 2. If the name *Teucrioideae applied to both a clade (PhyloCode) and a subfamily* (ICBN), they could be distinguished as Clade *Teucrioideae versus Subfamily Teucrioideae.*

6.2. Preexisting names are scientific names that, prior to their establishment under this code, were either: (a) "legitimate" (ICBN, BC), "potentially valid" (ICZN), or "valid" (ICVCN); or (b) in use but not governed by any code (e.g., zoological names ranked above the family group).

6.3. Converted names are preexisting names that have been established according to this code.

6.4. An acceptable name of a taxon is one that is in accordance with the rules of this code; that is, it is both (a) established and (b) not a non-conserved later homonym (Art. 15).

6.5. The accepted name of a taxon is the name that must be adopted for it under this code. It must (1) be established (Art. 7), (2) have precedence (Arts. 12–15) over alternative uses of the same name (homonyms) and alternative names for the same taxon (synonyms), and (3) not be rendered inapplicable by a qualifying clause in the context of a particular phylogenetic hypothesis (Art.11.9).

6.6. Once a name has been established, its status as an acceptable and/or accepted name is not affected by inaccurate or misleading connotations; thus, a name is not to be rejected because of a claim that it denotes a character, distribution, or relationship not possessed by the taxon.

Section 2. Establishment
Article 7. General Requirements

7.1. Establishment of a name can only occur on or after 1 January 200n, the starting date for this code.

7.2. In order to be established, a name of a taxon must: (a) be published as provided for by Article 4; (b) be adopted by the author(s), not merely proposed for the sake of argument or on the condition that the group concerned will be accepted in the future; (c) comply with the provisions of Articles 7 and 9–11; (d) be registered as provided for in Article 8, and the registration number be cited in the protologue; and (e) comply with the provisions of Article 17.

Note 7.2.1. The protologue is everything associated with a name when it was first established (this code), validly published (ICBN, BC), or made available (ICZN), for example, description or diagnosis, phylogenetic definition, registration number, designation of type, illustrations, references, synonymy, geographical data, specimen citations, and discussion.

7.3. When a publication contains a statement to the effect that names or nomenclatural acts in it are not to be considered for nomenclatural purposes, names that it may contain are considered as not established.

Article 8. Registration

8.1. In order for a name to be established under the PhyloCode, the name and other required information must be submitted to the PhyloCode registration database. A name may be submitted to the database prior to acceptance for publication, but it is not registered (i.e., given a registration number) until the author notifies the database that the paper or book in which the name will appear has been accepted for publication.

Note 8.1.1. Specification of the data that are required for registration can be obtained via the Internet or directly from the database administrator.
The registration procedure, a provisional list of required data, and the pertinent addresses are found in Appendix A.

Recommendation 8.1A. A name should not be submitted to the registration database more than one month before it is submitted for publication.

Recommendation 8.1B. Registration of a name whose spelling or definition is identical to one that already exists in the database should be avoided.
However, such names are not treated by this code as homonyms or synonyms until published.

Recommendation 8.1C. In order for the database to be as useful as possible for the scientific community, the author should provide the database with the publication reference as soon as the name is published.

8.2. At the submitter's request, a name or definition that he or she proposed can be changed or removed from the registration database if it is not yet published.
Recommendation 8.2A. The submitter of an unpublished registered name or definition who decides to change it or not to publish it should notify the database administrator promptly.

8.3. If the definition given at the time of registration differs from that given in the protologue, then the published definition is to be considered correct, and the database is to be annotated to alert users to the discrepancy.

Recommendation 8A. If a name or definition has been registered, but there is no indication in the registration database whether it was ever published, the name or definition should not be published by another person who has not first attempted to determine whether it was ever published. If bibliographic databases fail to resolve the question, a serious effort should be made to contact the person who registered the name or definition. (Contact information submitted with the name and maintained in the database may facilitate this.)

Recommendation 8B. If a serious but unsuccessful attempt has been made to determine whether a registered name was ever published, and the name is new (not based on a preexisting name), it is better to choose a different name, rather than use the same name and risk creating a homonym.

If, in the same situation, the registered name is based on a preexisting name, it is better to publish a definition of this name, even at the risk of creating a homonym, rather than choose another, less appropriate name. This is particularly true if the registered name is widely used.

Chapter IV. Clade Names
Article 9. General Requirements for Establishment of Clade Names

9.1. The names of clades may be established through conversion of preexisting names or introduction of new names.

9.2. In order to be established, the name of a clade must consist of a single word and begin with a capital letter (see also Art. 17).

9.3. In order to be established, converted clade names must be clearly identified as such in the protologue by the designation "converted clade name" or "*nomen cladi conversum.*" *New clade* names must be identified as such by the designation "new clade name" or "*nomen cladi novum.*"

9.4. In order to be established, a clade name must be provided with a phylogenetic definition, written in English or Latin, linking it explicitly with a particular clade. The name applies to whatever clade fits the definition.

Note 9.4.1. The following are examples of phylogenetic definitions (this list is not exhaustive):

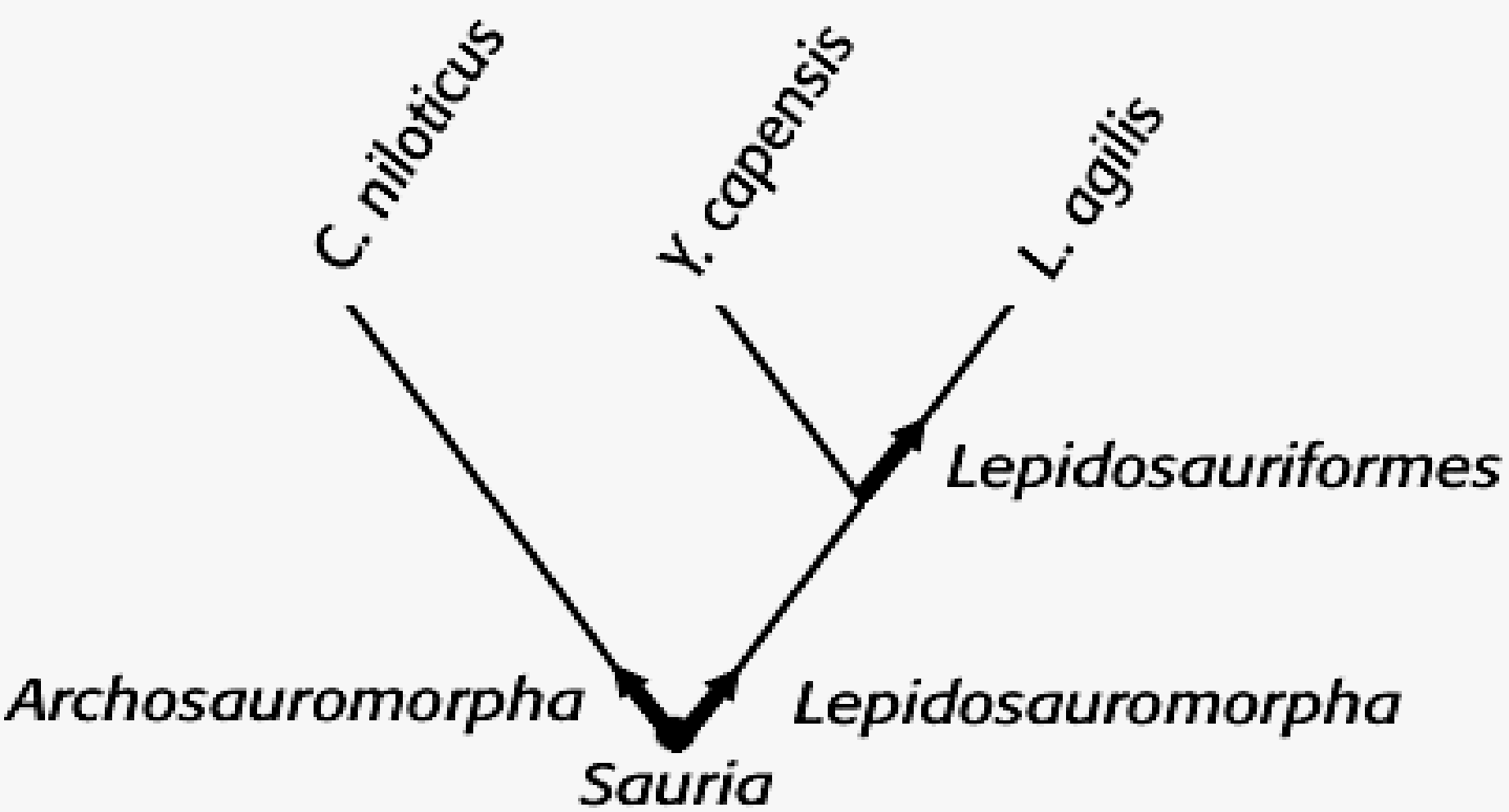


Figure 1

Suppose the name *Lepidosauriformes were defined as referring to the most inclusive* clade containing *Lacerta agilis Linnaeus 1758 but not Youngina capensis Broom 1914 (Fig. 1).*

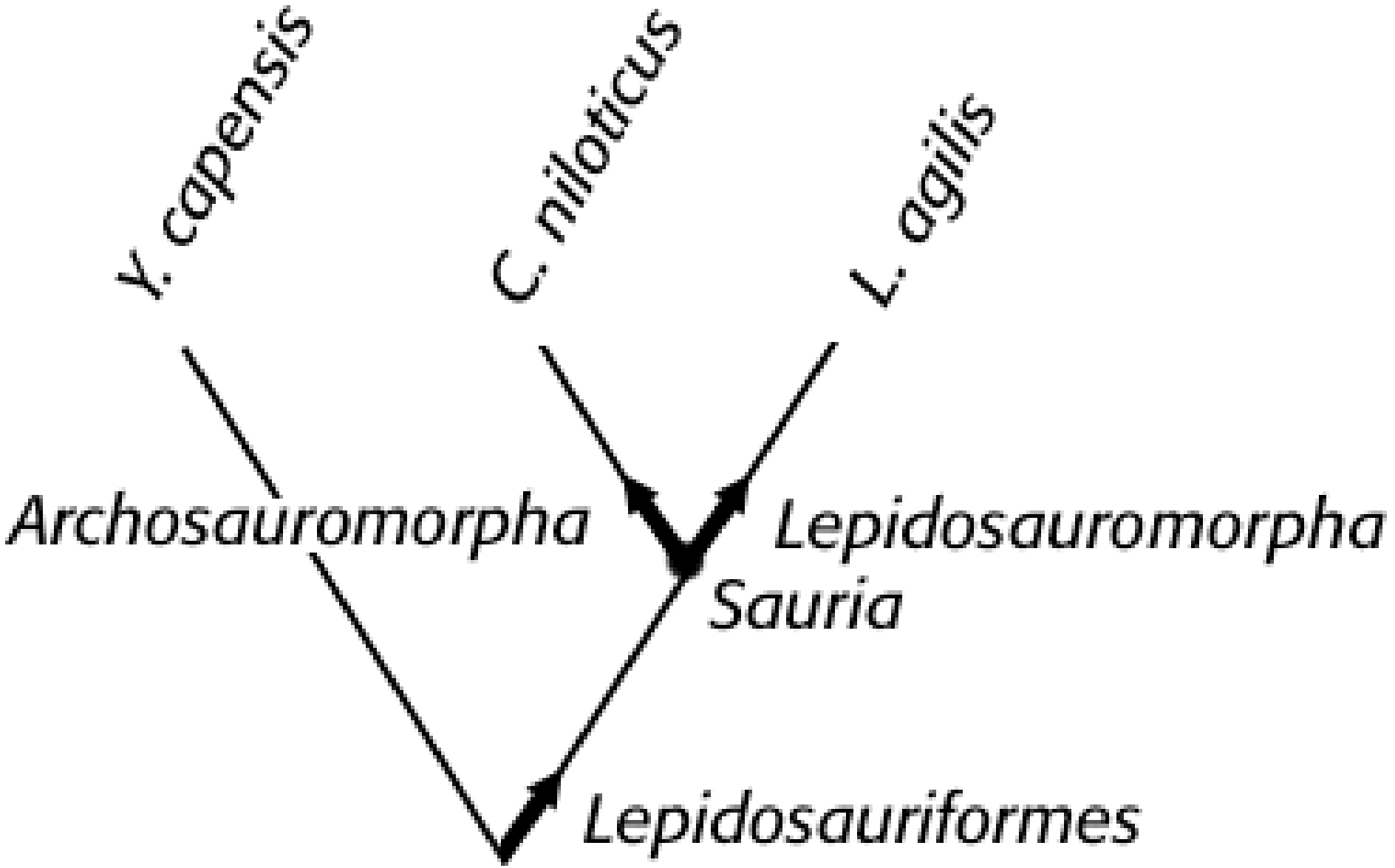

Y. capensis
C. niloticus
L. agilis
Archosauromorpha
Lepidosauromorpha
Sauria
Lepidosauriformes

Figure 2

Further suppose that all three of these taxa were considered to be included within the larger clade *Lepidosauromorpha (Clade (Lacerta agilis not Crocodylus niloticus Laurenti* 1768)), which was considered the sister group of the clade named *Archosauromorpha (Clade (Crocodylus niloticus not Lacerta agilis)). If Youngina capensis turned out to be outside of the* clade stemming from the most recent common ancestor of *Lacerta agilis and Crocodylus niloticus (a node-based clade named Sauria), then the name Lepidosauriformes would refer to a* clade more inclusive than the clade named *Lepidosauromorpha, reversing the former* hierarchical relationships of the names (Fig. 2).

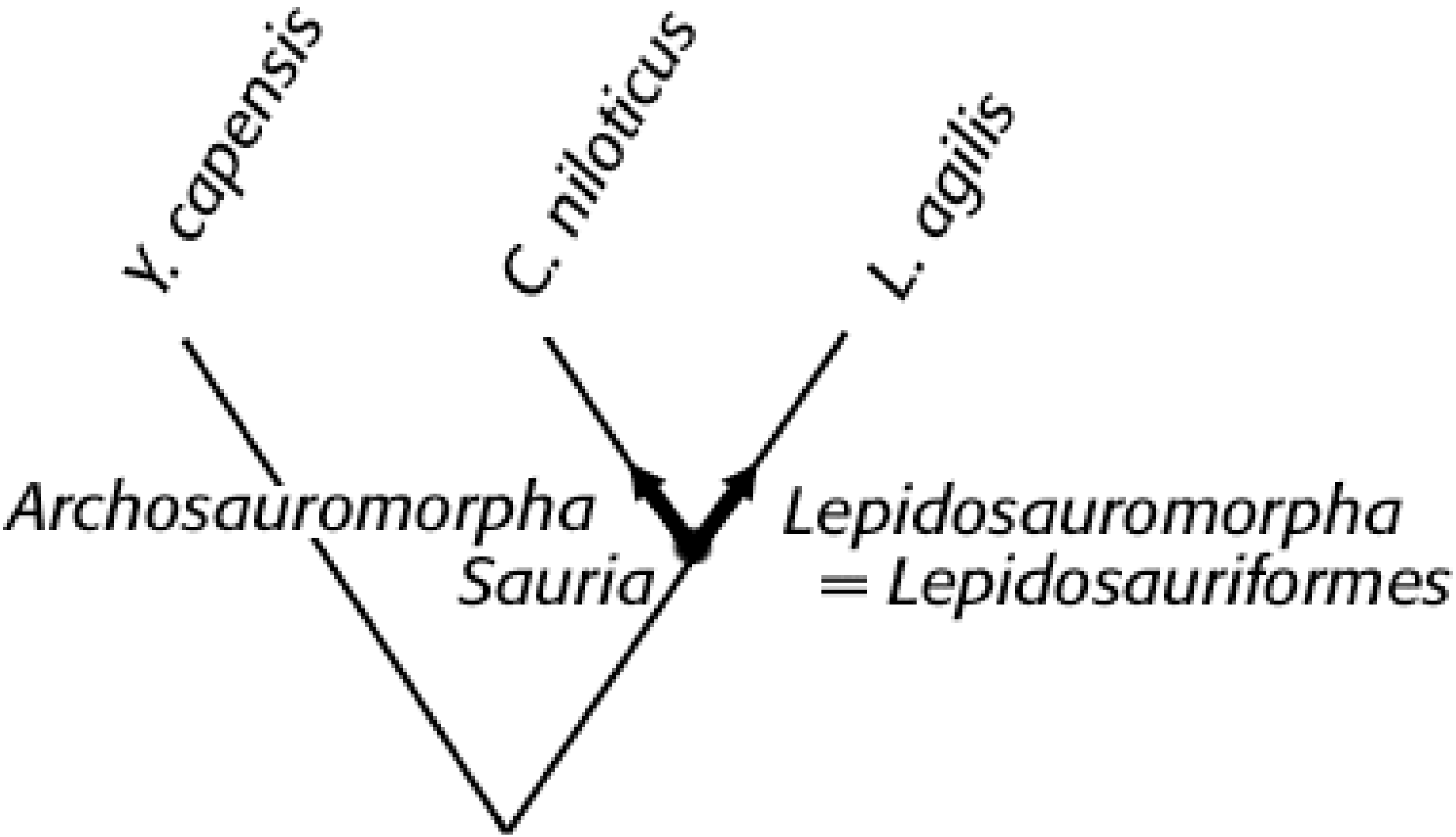

Y. capensis
C. niloticus
L. agilis
Archosauromorpha
Sauria
Lepidosauromorpha
= Lepidosauriformes

Figure 3

In order to prevent these names from reversing their hierarchical relationships, the name *Lepidosauriformes could be defined as "the most inclusive subclade of Sauria (Clade (Lacerta agilis and Crocodylus niloticus)) containing Lacerta agilis but not Youngina capensis," in which* case *Lepidosauriformes would become a synonym of Lepidosauromorpha (rather than the name* of a more inclusive clade) in the context of the new phylogenetic hypothesis (Fig. 3).

- *acceptable name. An established name that is not a (non-conserved) later homonym and thus*
- may potentially be an accepted name.
- *accepted name. The name that must be adopted for a taxon under this code.*
- *ancestor. An entity from which another entity is descended.*
- *apomorphy. A derived character state; a new feature that arose during the course of evolution.*
- *apomorphy-based clade. A clade conceptualized in terms of an apomorphy (i.e., a clade*
- stemming from the ancestor in which a particular apomorphy originated); a clade whose name is
- defined using an apomorphy-based definition.

- *apomorphy-based definition. A definition that associates a name with a clade originating with the*
- first ancestor of specified organisms and/or species (internal specifier taxa) to evolve a particular
- apomorphy (internal specifier apomorphy). See Note 9.4.1.
- *apomorphy-modified node-based definition. A node-based definition that incorporates wording* from apomorphy-based definitions to include certain (usually extant) organisms as internal
- specifiers without explicitly naming them. See Note 9.4.1. Apomorphy-modified node-based
- definitions can be used to associate names with crown clades when basal relationships within the
- crown are poorly understood or when the author intends to include in the named taxon
- subsequently discovered extant organisms that possess a particular apomorphy.

- *categorical rank. In the preexisting codes, a formal taxonomic rank such as family or genus.*
- *clade. An ancestor (an organism, population, or species) and all of its descendants.*
- *conditionally suppressed name. A name that is suppressed only in phylogenetic contexts in*
- which it is a synonym of a particular conserved name (see suppressed name).
- *conserved name. An established name that the Committee on Phylogenetic Nomenclature has*
- ruled should have precedence over earlier synonyms or homonyms.
- *converted (clade) name. A preexisting name that has been established in accordance with the*
- rules of this code (see new (clade) name).

- *crown clade. A clade within which both of the basal branches have extant representatives.*
- *crown clade definition. Any definition that ties a name to a crown clade—e.g., stem- and*
- apomorphy-modified node-based definitions and standard node-based definitions in which all the specifiers represent extant species or organisms.
- *definition. A statement specifying the meaning of a name (i.e., the taxon to which it refers).*
- *description. A statement of the features of a taxon (or its component organisms), not limited to* those that distinguish it from other taxa with which it might be confused (see "diagnosis").
- *diagnosis. A brief statement of the features of a taxon that collectively distinguish it from other* taxa with which it might be confused.

- *established name. A name that is published in accordance with Article 7 of this code, which may*
- or may not be an acceptable or accepted name.
- *external specifier. A specifier that is explicitly excluded from the clade whose name is being*
- defined. Stem-based definitions have external specifiers, but node- and apomorphy-based
- definitions do not (see internal specifier).
- *heterodefinitional. Based on different phylogenetic definitions (see synonym).*
- *homodefinitional. Based on the same phylogenetic definition (see synonym).*

- *homologous. Shared by virtue of inheritance from a common ancestor. A character or character* state shared by two organisms (which may represent different species or clades) is said to be homologous if that character or character state was present in all of their ancestors back to and including their most recent common ancestor.
- *homonym. A name that is spelled identically to another name but potentially refers to a different*
- taxon. In this code, homonyms are established and identically spelled clade names based on different phylogenetic definitions.

- *hybrid formula. An expression consisting of the names of two taxa separated by a multiplication* sign, designating a single organism or set of organisms of hybrid origin.
- *internal specifier. A specifier that is explicitly included in the clade whose name is being*
- defined. All specifiers in node-based and apomorphy-based definitions are internal, but only some of the specifiers in stem-based definitions are (see external specifier).

lineage. A series of entities (e.g., organisms, populations) that form a single unbroken and unbranched sequence of ancestors and descendants. That a lineage is unbranched does not deny the existence of side-branches, which are not parts of the lineage in question, or of branching at lower organizational levels (e.g., organelle lineages within a population lineage). There may even be branching at the organizational level in question as long as it is judged to be temporary.

- *monophyletic. A set consisting of an ancestor and all of its descendants; usually used for groups* the members of which share a more recent common ancestor with one another than with any non-members, though monophyletic groups of organisms within sexually reproducing species/populations may not have this property.
- *name. A word or words used to designate (refer to) an organism or a group of organisms. See* acceptable name, accepted name, established name, replacement name, scientific name, taxon name.
- *new (clade) name. A newly proposed name that has been established in accordance with the rules* of this code (see converted (clade) name).

node-based clade. A clade conceptualized in terms of a node (i.e., a clade encompassing all branches stemming from a particular node on a phylogenetic tree); a clade whose name is defined using a node-based definition.

node-based definition. A definition that associates a name with a clade originating at a node (on a phylogenetic tree) representing the most recent common ancestor of specified descendant organisms and/or species (internal specifiers).

- *paraphyletic. A set including an ancestor but excluding some or all of its descendants.*
- *phylogenetic. Of or pertaining to the history of ancestry and descent.*
- *phylogenetic definition. A statement explicitly linking a taxon name with a particular clade.*
- *phylogenetic system (of nomenclature). An integrated set of principles and rules governing the*
- naming of taxa and the application of taxon names that is based on the principle of common
- descent. This code describes a phylogenetic system of nomenclature.
- *polyphyletic. A set group that has multiple phylogenetic origins and thus excludes the most*
- recent common ancestor of its members.

- *precedence. The order of preference among established names, used to select the accepted name* from among them. In general, precedence is based on the date of establishment, with earlierestablished names having precedence over later ones, but later-established names may be conserved over earlier ones.

- *preexisting codes. The codes of biological nomenclature that were in operation when the* PhyloCode was drafted (1997–2000)—specifically, the International Code of Botanical Nomenclature, the International Code of Zoological Nomenclature, the International Code of Nomenclature of Bacteria and the International Code of Virus Classification and Nomenclature.

- *preexisting name. A scientific name that, prior to its establishment under the PhyloCode, was* either: (a) "legitimate" (ICBN, BC), "potentially valid" (ICZN), or "valid" (ICVCN); or (b) in use but not governed by any code (e.g., zoological names ranked above the family group).
- *protologue. Everything associated with a name when it was first established (PhyloCode),* validly published (ICBN, BC), or made available (ICZN), for example, description, diagnosis, phylogenetic definition, registration number, designation of type, illustrations, references, synonymy, geographical data, specimen citations, and discussion.

- *qualifying clause. A part of a phylogenetic definition that specifies conditions under which the* defined name cannot be applied.
- *rank-based system (of nomenclature). An integrated set of principles and rules governing the* naming of taxa and the application of taxon names that is based on taxonomic ranks (e.g.,
- kingdom, phylum, etc.). Also referred to as the "traditional system."
- *replacement name. A new name explicitly substituted for a previously established name that is* not acceptable because it is a later homonym. A replacement name is equivalent to a *nomen substitutum in this code. (The term "replacement name" has been used in a broader sense under* the ICZN to include what the ICBN and this code refer to as a superfluous name and the ICZN refers to as an unnecessary substitute name.)

- *scientific name. A name that either is formed and governed by one of the codes of biological* nomenclature or is of a similar Latinized form (e.g., zoological names ranked above the family group).
- *species. A segment of a population-level lineage that is separate from other such lineage* segments as indicated by one or more of various possible criteria (e.g., distinguishability, reproductive isolation, monophyly, etc.).
- *specifier. A species, specimen, or apomorphy cited in a phylogenetic definition of a name as a* reference point that serves to specify the clade to which the name applies.

one entire branch stemming from a particular node on a phylogenetic tree); a clade whose name is defined using a stem-based definition.

stem-based definition. A definition that associates a name with a clade originating with a stem (on a phylogenetic tree) representing the ancestral lineage of specified organisms and/or species (internal specifiers) after its divergence from the ancestral lineage of other specified organisms and/or species (external specifiers).

- *stem-modified node-based definition. A node-based definition that incorporates wording from*
- stem-based definitions to include certain (usually extant) organisms as internal specifiers without explicitly naming them. See Note 9.4.1. Stem-modified node-based definitions can be used to associate names with crown clades when basal relationships within the crown are poorly understood or when the author intends to include in the named taxon subsequently discovered extant organisms that share a more recent common ancestor with the currently known members of the named taxon than with other currently known taxa.

- *superfluous name. A name that was substituted for another name that was acceptable and should* therefore have been used.
- *suppressed name. A name that would normally have precedence but does not, due to a decision* by the Committee on Phylogenetic Nomenclature to give precedence to a later synonym or homonym.

- *synapomorphy. A shared, derived character state. In this code, a synapomorphy is a shared,* derived character state inherited from a common ancestor that possessed that state; a shared, independently derived character state is not considered to be a synapomorphy in the sense the term is used in this code.

- *synonym. A name that is spelled differently than another name that refers to the same taxon. In* the case of clade names, synonyms may be homodefinitional or heterodefinitional.
- *taxon. A taxonomic group of organisms. In this code, taxa may be clades or species, though the* rules of this code apply only to clade names.
- *taxon name. The word (or, in preexisting codes, words) used to designate a taxon. total clade. A clade composed of a crown clade and all species and/or organisms that share a* more recent common ancestor with that crown clade than with any other mutually exclusive crown clade.

Table 1. Equivalence table of nomenclatural terms used in the Draft PhyloCode, the Draft BioCode and the current biological codes, except the International Code of Virus Classification and Nomenclature (patterned after a similar table in the Draft BioCode). The criteria represented by terms treated here as equivalent are not always exactly the same (e.g., establishment of a clade name in the PhyloCode requires a phylogenetic definition, which is not a requirement of any other code). BioCode = Draft BioCode (Taxon 47: 127–150 [1997]). Bacteriological Code = International Code of Nomenclature of Bacteria (1992). Botanical Code = International Code of Botanical Nomenclature (2000). Zoological Code = International Code of Zoological Nomenclature (1999).

PhyloCode	BioCode	Bacteriological Code	Botanical Code	Zoological Code
Publication and precedence of names				
published	published	effectively published	effectively published	published
precedence	precedence	priority	priority	precedence
earlier	earlier	senior	earlier	senior
later	later	junior	later	junior
Nomenclatural status				
established	established	validly published	validly published	available
converted	----------	----------	----------	----------
acceptable	acceptable	legitimate	legitimate	potentially valid
registration	registration	validation	registration	----------
Taxonomic status				
accepted	accepted	correct	correct	valid

PhyloCode	BioCode	Bacteriological Code	Botanical Code	Zoological Code
Synonymy and homonymy				
homodefinitional heterodefinitional	homotypic heterotypic	objective subjective	nomenclatural taxonomic	objective subjective
replacement name	replacement name	deliberate substitute	avowed substitute	new replacement name
superfluous name	----------	----------	superfluous name	unnecessary substitute name
Conservation and suppression				
conserved	conserved	conserved	conserved	conserved
suppressed	suppressed/ rejected	rejected	rejected	suppressed

DIFFERENCES BETWEEN ZOOLOGICAL & BOTANICAL CODES

IN COMMON: stability, priority, hierarchy, types, Latin names

DIFFERENCES:

- Suprageneric name endings
- Italicization
- Ranks covered
- Infraspecific connecting terms
- Principle of Coordination & autonyms
- Different terminologies
- Different kinds of type specimens
- Recombining author
- Square brackets
- Tautonyms
- Illegitimacy
- Recent vs date for priority
- Hyphens allowed in genus & species names

SUPRAGENERIC NAME ENDINGS

These are very different for equivalent ranks in the two codes.

Examples of "homonyms":

	ZOOLOGICAL CODE	BOTANICAL CODE
-idae	Family	Subclass
-inae	Subfamily	Subtribe

RANKS COVERED

ZOOLOGICAL CODE	BOTANICAL CODE
(Kingdom)	Kingdom
(Phylum)	Division or Phylum
(Class)	Class
(Order)	Order
Family	Family
Tribe	Tribe
Genus	Genus
-	Section
-	Series
Species	Species
-	Variety
-	Form
[plus sub-categories of all & super-categories above Genus]	[plus subcategories of all]

["( )" indicates: not regulated by the code except for certain basic principles]

DIFFERENT TERMINOLOGIES

ZOOLOGICAL CODE	BOTANICAL CODE
Junior homonym	Later homonym
Objective synonym	Nomenclatural synonym
Subjective synonym	Taxonomic synonym
Available	Validly published
Valid name	Correct name
Specific name	Specific epithet
Binomen, name of a species	Specific name

RECOMBINING AUTHOR

ZOOLOGICAL CODE

E.g.:

Motacilla troglodytes L., 1758

Viellot (1806) makes recombination:

Troglodytes troglodytes (L., 1758)

Original author in ( ) with date, no recombining author.

BOTANICAL CODE

E.g.:

Petrophiloides richardsonii Bowerbank (1840)

Chandler (1964) makes recombination:

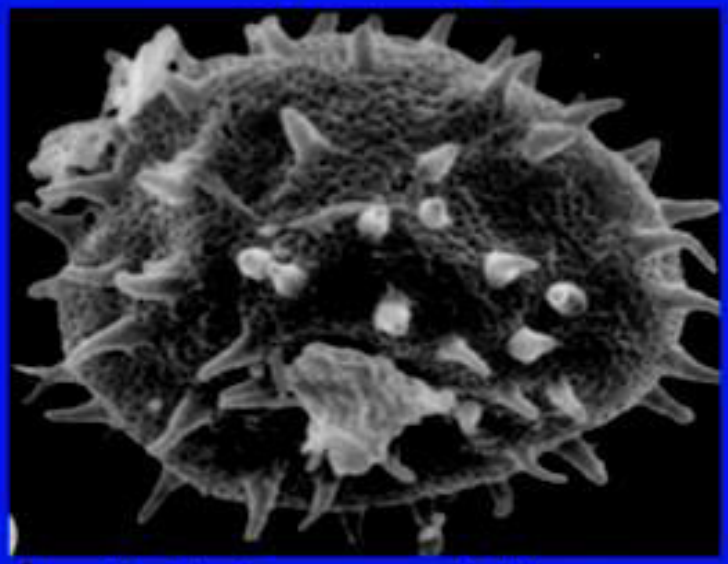
Platycarya richardsonii (Bowerbank) Chandler (1964)

Original author in ( ) without date, recombining author added.

[N.B. in botany, brackets round date not mandatory. Abbreviated author not followed by comma.]

MORPHOTAXA

"Fossil taxa may be treated as morphotaxa. A morphotaxon is defined as a fossil taxon which, for nomenclatural purposes, comprises only the parts, life-history stages, or preservational states represented by the corresponding nomenclatural type."



Spinizonocolpites: pollen of the palm genus *Nypa*.

Araucarioxylon: wood of the family Araucariaceae

DIFFERENT TERMINOLOGIES

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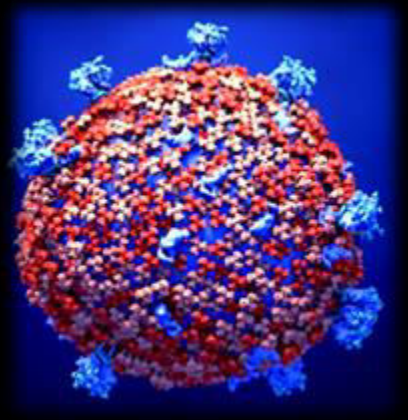
Acknowledgement:

I would like to thank our *Honourable Vice Chancellor* Professor Ranjan Chakarborti for giving me the opportunity to contribute in E-learning process which will be very much helpful for our students during unprecedented situation due to CORONA Virus (COVID-19).

We shall overcome!!!!!!!!



#SAVE FROM CORONA

Stay Home

Save your Life

Save your Family

Save your Society

Save your Country

Save your beautiful Planet