International Code of Zoological Nomenclature (ICZN): Operative Principles and Important Rules

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INTRODUCTION

- The International Code of Zoological Nomenclature (ICZN) is a widely accepted convention in zoology that rules the formal scientific naming of organisms treated as animals. It is also informally known as the ICZN Code, for its publisher, the International Commission on Zoological Nomenclature (which shares the acronym "ICZN"). The rules principally regulate:

  A. How names are correctly established in the frame of binominal nomenclature?

  B. Which name must be used in case of name conflicts?

  C. How scientific literature must cite names?

- Zoological nomenclature is independent of other systems of nomenclature, for example botanical nomenclature. This implies that animals can have the same generic names as plants.
- 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 a guiding force in naming animals It is meant to guide only the nomenclature of animals, while leaving zoologists freedom in classifying new species and taxa.
- In other words, whether a species itself is or is not a recognized entity is a subjective decision, but what name should be applied to it is not. The code applies only to the latter. 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 (e.g., the "scientific name" for the Loch Ness Monster).

INTRODUCTION : COTD..

- 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 decided first by applying the code directly, and not by reference to precedent.

- The code is also retroactive or retrospective, which means that previous editions of the code, or previous other rules and conventions have no force any more today and the nomenclatural acts published 'back in the old times' must be evaluated only under the present edition of the code. In cases of disputes concerning the interpretation, the usual procedure is to consult the French Code, lastly a case can be brought to the commission who has the right to publish a final decision.
- The code consists of three main parts –The Code proper , Appendices and Glossary.
- The Code Proper includes preamble followed by 90 consecutively numbered Articles grouped in 18 chapters. Each article is composed of one or more mandatory provisions which are some times accompanied by recommendations or illustrative examples.
- The use of recommendations are not mandatory but lays down the best procedure for cases not strictly covered by the applications of the rules. These are designated by the number of articles with which they are associated followed by appropriate capital letters e.g., recommendations 10A,72B, 73C, 74 D etc.
- There are three appendices . The first two have the status of recommendations and the third is the constitution of the Commission.
- The terms used un the text are clearly defined in the Glossary, which is an integral part of the Code. The International Commission on Zoological Nomenclature is the author of this code.

* Basic Operative Principles of ICZN

- International code for Zoological nomenclature(ICZN) is governed by six basic central operative principles for naming the animals systematically:

1. Principle of binominal nomenclature,
2. Principle of priority,
3. Principle of coordination,
4. Principle of the first reviser,
5. Principle of homonymy and
6. Principle of typification.

* Basic Operative Principles of ICZN: Principle of Bionomial Nomenclature

1. PRINCIPLES OF BINOMIAL NOMENCLATURE :

- This is the principle that the scientific name of a species, and not of a taxon at any other rank, is a combination of two names; the use of a trinomen for the name of a subspecies and of uninominal names for taxa above the species group is in accord with this principle. It is included in Uni-, Bi- and Tri-nominalism.

- This means that in the system of nomenclature for animals, the name of a species is composed of a combination of a generic name and a specific name; together they make a "binomen". No other rank can have a name composed of two names. Examples: Species *Giraffa* camelopardalis. The names of the ‘Binomen’ have actually opposite functions- the specific name expresses distinctness while the generic name relationship.

- Subspecies have a name composed of three names, a "trinomen": generic name, specific name, sub-specific name: Subspecies *Giraffa camelopardalis rothschildi.*

- Taxa at a rank above species have a name composed of one name, a "uninominal name“ like Genus Giraffa, family Giraffidae.
- In botanical nomenclature, the equivalent for "binominal nomenclature" is "binary nomenclature" (or sometimes "binomial nomenclature").

* Basic Operative Principles of ICZN: Principle of Priority

2. PRINCIPLES OF PRIORITY

- This is the principle that the correct formal scientific name for an animal taxon, the valid name, correct to use, is the oldest available name that applies to it. It is the most important principle—the fundamental guiding precept that preserves zoological nomenclature stability.
- It was first formulated in 1842 by a committee appointed by the British Association to consider the rules of zoological nomenclature. **Hugh Edwin Strickland** wrote the committee's report.

Example:

- Nunneley, 1837 established *Limax maculatus* (Gastropoda), Wiktor, 2001 classified it as a junior synonym of *Limax maximus Linnæus* 1758 from Southern and Westrern Europe. *Limax maximus* was established first, so if Wiktor's, 2001 classification is accepted, *Limax maximus* takes precedence over Limax maculatus and must be used for the species.
- There are approximately 2-3 million cases of this kind for which this principle is applied in zoology.

* Basic Operative Principles of ICZN: Principle of Co-ordination

3. PRINCIPLES OF CO ORDINATION :

- **The principle of coordination** is that within the family group, genus group and species group, a name established for a taxon at any rank in the group is simultaneously established with the same author and date for taxa based on the same name-bearing type at other ranks in the corresponding group. In other words, publishing a new zoological name automatically and simultaneously establishes all corresponding names in the relevant other ranks with the same type.
- In the **species-group**, publishing a 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): genus *Giraffa Linnaeus*, 1758 and subgenus *Giraffa (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 (family Giraffidae, superfamily Giraffoidea, subfamily Giraffinae).
- Author citations for such names (for example a subgenus) are the same as for the name actually published (for example a genus). 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.

* Basic Operative Principles of ICZN: Principle of the first Reviser

4. PRINCIPLES OF FIRST REVISER :

- This is the principle that in cases of conflicts between simultaneously published divergent acts, the first subsequent author can decide which has precedence. 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. 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 and chooses and publishes the decision in the required manner is the first reviser, and is to be followed.

Example:

- Linnæus, 1758 established *Strix scandiaca* and *Strix noctua* (Aves), for which he gave different descriptions and referred to different types, but both taxa later turned out to refer to the same species, the snowy owl.
- The two names are subjective synonyms. Lönnberg, 1931 acted as first reviser, cited both names and selected *Strix scandiaca* to have precedence.

* Basic Operative Principles of ICZN: Principle of Homonymy

5. PRINCIPLE OF HOMONYMY :

- This is the principle that the name of each taxon must be unique. Consequently, a name that is a junior homonym of another name must not be used as a valid name.
- It means that any one animal name, in one particular spelling, may be used only once (within its group). This is usually the first-published name; any later name with the same spelling (a homonym) is barred from being used.
- The principles of priority and first reviser apply here. For family-group names the termination (which is rank-bound) is not taken into account. Genera are homonyms only if, exactly the same — a one-letter difference is enough to distinguish them.

Examples:

Argus Bohadsch, 1761 (Gastropoda) (was made available for homonymy by ICZN in Opinion 429, Bohadsch, 1761 was non-binominal - this had the effect that no other one of the various following names *Argus* can be used for a taxon)

- *Argus Scopoli*, 1763 (Lepidoptera: Lycaenidae: Polyommatinae)
- *Argus Scopoli*, 1777 (Lepidoptera: Nymphalidae: Satyrinae)
- *Argus Poli*, 1791 (Bivalvia)
- *Argus Temminck*, 1807 (Aves)
- *Argus Lamarck*, 1817 (Lepidoptera: Hesperiidae)
- *Argus Walckenaer*, 1836 (Araneae)
- *Argus Gerhard*, 1850 (Lepidoptera: Lycaenidae: Theclinae)

Homonyms of Argus are not:

- *Argua Walker, 1863* (Lepidoptera), *Argusa Kelham*, 1888 (Aves), *Argusina Hebard*, 1927 (Dermaptera), *Arcus Hong*, 1983 (Diptera), *Argas Latreille*, 1795 (Araneae), *Argulus Müller*, 1785 (Crustacea).

* Basic Operative Principles of ICZN: Principle of Homonymy –Contd..

- Homonyms are not: *Isomya Cutler & Cutler*, 1985 (Sipunculida), *Isomyia Walker,* 1859 (Diptera).
- Homonyms are not: *Adelomya Mulsant & Verreaux*, 1866 (Aves), *Adelomyia Bonaparte*, 1854 (Aves), *Adelomys Gervais*, 1853 (Mammalia), *Adolomys Shevyreva*, 1989 (Mammalia), *Adulomya Kuroda*, 1931 (Bivalvia).
- In species, there is a difference between primary and secondary homonyms. There can also be double homonyms (same genus and species). A slight difference in spelling is tolerated if Article 58 applies.

PRIMARY HMONYMS :

- **Primary homonyms** are those with the same genus and same species in their original combination. The difference between a primary junior homonym and a subsequent use of a name is undefined, but it is commonly accepted that if the name referred to another species or form, and if there is in addition no evidence the author knew that the name was previously used, it is considered as a junior homonym.

Examples:

- Drury (1773) established *Cerambyx maculatus* (Coleoptera) for a species from Jamaica. Fueblin (1775) established *Cerambyx maculatus* for a different species from Switzerland, and did not refer to Drury's name. Fueblin's name is a junior primary homonym.
- Scopoli (1763) established *Curculio fasciatus* (Coleoptera) for a species from Slovenia. Strøm (1768) established *Curculio fasciatus* for another species from Norway. De Geer (1775) established *Curculio fasciatus* for a 3rd species from Sweden. Müller (1776) established *Curculio fasciatus* for a 4th species from Denmark. Fourcroy (1785) established *Curculio fasciatus* for a 5th species from France. Olivier (1790) established *Curculio fasciatus* for a 6th species from France. Marsham (1802) established *Curculio fasciatus* for a 7th species from Britain. All these names had descriptions that clarified that different species were meant, and that their authors did not know that the name had been established by a previous author.

* Basic Operative Principles of ICZN: Principle of Homonymy-contd…

SECONDARY HOMONYMS :

- **Secondary homonyms** can be produced if taxa with the same specific name but different original genus are later classified in the same genus (Art. 57.3, 59). A secondary synonym, is only a temporary state, it is only effective in this classification. If another classification is applied, the secondary homonymy may not be produced, and the involved name can be used again (Art. 59.1). A name does not become unavailable or unusable if it was once in the course of history placed in such a genus where it produced a secondary homonymy with another name. This is one of the rare cases where a zoological species does not have a stable specific name and a unique species-author-year combination, it can have two names at the same time.

Example:

- Nunneley (1837) established *Limax maculatus* (Gastropoda), Wiktor (2001) classified it as a junior synonym *of Limax (Limax) maximus Linnæus*, 1758 from Southern and Western Europe. Kaleniczenko, 1851 established *Krynickillus maculatus* for a different species from Ukraine. Wiktor, 2001 classified both *Limax maximus Linnæus*, 1758 and *Krynickillus maculatus Kaleniczenko*, 1851 in the genus Limax. This meant that *L. maculatus Nunneley*, 1837 and *K. maculatus Kaleniczenko*, 1851 were classified in the same genus, so both names were secondary homonyms in the genus Limax, and the younger name (from 1851) could not be used for the Ukrainian species. This made it necessary to look for the next younger available name that could be used for the Ukrainian species. This was *Limax ecarinatus Boettger*, 1881, a junior synonym of *K. maculatus Kaleniczenko*, 1851.
- For Wiktor (2001) and those authors who follow Wiktor's system the name of the Ukrainian species must be *Limax ecarinatus Boettger*, 1881. For the others who classify *Limacus* as a separate genus, the name of the Ukrainian species must be *Limacus maculatus* (Kaleniczenko, 1851).
- So the Ukrainian species can have two names, depending from its generic classification. ***Limax ecarinatus***, & ***Limacus maculatus***, the same species. Article 59.3 states that in exceptional cases, junior secondary homonyms replaced before 1961 by substitute names can become invalid, "...unless the substitute name is not in use," an exception of the exception. However, the ICZN Code does not give an example for such a case. It seems that this passage in the ICZN Code is widely ignored. It also does not define what the expression "is not in use" should mean.

Example:

- Glischrus caelata Studer, 1820 (Gastropoda) was once classified in the genus Helix, and became a junior secondary homonym of Helix caelata [Vallot], 1801. Locard (1880) established a replacement name Helix glypta, which has very rarely been used. The species is now known as Trochulus caelatus (Studer, 1820), and Art. 59.3 is commonly ignored.

* Basic Operative Principles of ICZN: Principle of Homonymy-contd..

DOUBLE HOMONYMY :

- **Double homonymy** (genus and species) is no homonymy: if the genera are homonyms and belong to different animal groups, the same specific names can be used in both groups.

Examples:

- The name *Noctua Linnæus*, 1758 was established for a lepidopteran subgenus. In 1764 he established a genus *Noctua Linné* ,1764 for birds, ignoring that he had already used this name a few years ago in Lepidoptera. *Noctua Linné*, 1764 (Aves) is a junior homonym of *Noctua Linnæus*, 1758 (Lepidoptera).
- Garsault (1764) used Noctua for a bird and established a name *Noctua caprimulgus Garsault*, 1764 (Aves). Fabricius (1775) established a name *Noctua caprimulgus Fabricius*, 1775 (Lepidoptera), thus creating a double homonym. Double homonymy is no homonymy, both names are available.
- The same happened with *Noctua variegata Jung*, 1792 (Lepidoptera) and *Noctua variegata Quoy & Gaimard*, 1830 (Aves).
- For disambiguating one genus-group name from its homonym, it is important to cite author and year. Citing the author alone is often not sufficient.

Examples:

- *Echidna Forster*, 1777 (Actinopterygii), not *Echidna Cuvier*, 1797 (Mammalia)
- *Ansa Walker*, 1858 (Lepidoptera), not *Ansa Walker*, 1868 (Hemiptera)
- *Helix balcanica Kobelt*, 1876, not *Helix balcanica Kobelt*, 1903 (both Gastropoda)
- *Conus catenatus Sowerby*, 1850, not *Conus catenatus Sowerby*, 1875 (both Gastropoda)
- The name *Ansa* can only be used for a lepidopteran taxon. If that name cannot be used (for example because an older name established prior to 1858 takes precedence), this does not mean that the 1868 name can be used for a hemipteran genus. The only option to use the 1868 name for the hemipteran taxon is to get the 1858 name officially suppressed by the commission.

* Basic Operative Principles of ICZN: Principle of Homonymy Contd…

- In some cases, the same genus-group or species-group name was published in the same year by the same author. In these cases it is useful to cite the page where the name was established.

- *Amydona Walker,* 1855 (Lepidoptera: Limacodidae) (p. 1110), not *Amydona Walker,* 1855 (Lepidoptera: Lasiocampidae) (p. 1413)
- *Betousa Walker,* 1865 (Lepidoptera: Thyridae) (p. 1111), not *Betousa Walker,* 1865 (Lepidoptera: Noctuidae) (p. 1208).
- *Cicada variegata Fabricius,* 1775 (p. 684), not *Cicada variegata Fabricius,* 1775 (p. 686) (both Auchenorrhyncha).
- *Noctua marginata Fabricius,* 1775 (p. 597), not *Noctua marginata Fabricius,* 1775 (p. 610) (both Lepidoptera: Noctuidae).
- *Clausilia (Albinaria) oertzeni Boettger,* 1889 (p. 42), not *Clausilia (Albinaria) schuchi var. oertzeni Boettger,* 1889 (p. 52) (both Gastropoda: Clausiliidae).

- There are cases where two homonyms were established by the same author in the same year on the same page: *Zonites verticillus var. graeca Kobelt,* 1876 (Gastropoda) (p. 48), not *Zonites albanicus var. graeca Kobelt,* 1876 (p. 48).

* Basic Operative Principles of ICZN: Principle of Homonymy Contd…

- Animal, plant, and fungi nomenclature are entirely independent from each other. The most evident shortcoming of this situation (for their use in biodiversity informatics) is that the same generic name can be used simultaneously for animals and plants. For this kind of homonym the expression "hemihomonym" is sometimes used. Far more than 1000 such names are known.**Examples:**
- The generic name *Dryas L.* (1753) represents a genus of magnoliophytan plants (family Rosaceae), and at the same time *Dryas Hübner,* 1807 is also a lepidopteran insect genus (family Nymphalidae).
- The genus *Tandonia* was established in animals (Gastropoda: *Tandonia*), in plants (Euphorbiaceae) and in Fungi (Ascomycetes).
- Other examples for sometimes well known plant names with zoological equivalents are *Aotus* (Fabaceae and Mammalia), *Arenaria* (Caryophyllaeceae and Aves), *Betula* (Betulaceae and Hymenoptera), *Chloris* (Cactaceae and Aves), *Dugesia* (Asteraceae and Plathelminthes), *Erica* (Ericaceae and Araneae), *Hystrix* (Poaceae and Mammalia), *Iris* (Asparagales and Orthoptera), *Liparis* (Orchidaceae and Actinopterygii), *Phalaenopsis* (Asparagales and Aves), *Pinus* (Pinaceae and Mollusca), *Prunella* (Lamiaceae and Aves), *Ricinus* (Fabaceae and Acari), *Taxus* (Taxaceae and Mammalia), *Typha* (Typhaceae and Porifera), *Ulva* (Ulvophyceae and Lepidoptera), *Viola* (Violaceae and Lepidoptera).
- For names above the family level, the principle of homonymy does not apply.

Examples:

- Pulmonata is usually used for a very prominent group in Gastropoda, but the name is also (rarely) used for a group in Arachnida.
- Reticulata is used as an order in Foraminifera, and as an undefined higher group in Ephemeroptera.

* Basic Operative Principles of ICZN: Principle of Homonymy Contd…

- Homonyms occur relatively rarely in families (only if generic names are identical or very similar and adding an ending "-*idae*" produces identical results). Discovering such a homonymy usually produces the same problems as if, there were no rules: conflicts between entirely independent and unconnected groups of taxonomists working in different animal groups. Very often the Commission must be asked to take a decision.

Examples:

- *Bulimina* (Foraminifera) and *Buliminus* (Gastropoda) give both Buliminidae, and both families were used since the 1880s. When the homonymy was discovered 110 years later in the 1990s, the younger (gastropod) taxon had to receive a new family name, and the commission needed was asked for a solution (Opinion 2018).
- *Claria* (Rotifera) and *Clarias* (Actinopterygii) give both Clariidae, but only the actinopterygian fish name was used since 1845. Shortly after Clariidae had been proposed in Rotifera in 1990, the homonymy was discovered and the commission had to decide that the Rotiferan family had to be amended to Clariaidae.

* Basic Operative Principles of ICZN: Principle of Typification

6. PRINCIPLES OF TYPIFICATION :

- **Principles of typification** is the principle that each nominal taxon in the family group, genus group, or species group has—actually or potentially—a name-bearing type fixed that provides the objective standard of reference that determines what the name applies to.
- This means that any named taxon has a name-bearing type, which allows the objective application of that name. Any family-group name must have a type genus, any genus-group name must have a type species, and any species-group name can have one or more type specimens (holotype, lectotype, neotype, syntypes, or others), usually deposited in a museum collection. The type genus for a family-group name is simply the genus that provided the stem to which was added the ending *"-idae"* (for families).

Example:

- The family name Spheniscidae has as its type genus the genus *Spheniscus Brisson*, 1760.
- The type species for a genus-group name is more complicated and follows exactly defined provisions in articles 67–69. Type species are very important, and no general zoological database has recorded the type species for all genera. Except in fishes and some minor groups, type species are rarely reliably recorded in online animal databases. In 60% of the cases the type species can be determined in the original publication. The type species is always the original name of the taxon (and not the currently used combination).

Example:

- The correctly cited type species of *Locusta Linnæus*, 1758 (Caelifera) is *Gryllus migratorius Linnæus*, 1758, not *Locusta migratoria (Linnæus*, 1758).
- Designation and fixation have different meanings. A **designation** is the proposal of the type species. It is not necessary to have spelled the name of the genus or species correctly with correct authors (articles 67.2.1, 67.6, 67.7), type species are always the correctly spelled name. If the designation is valid, the type species is fixed.
- A designation can also be invalid and ineffective—for example—if the genus had already a previously fixed type species, or if a type species was proposed that was not originally included, or contradicted the description or figure for a genus for which no species had originally been included.

* Basic Operative Principles of ICZN: Principle of Typification- Contd…

- There are various possible modes of type species designation. This is their order of legal importance, with approximate proportions of occurrence[note 2] and examples:

Superior type fixation:

Designation by ICZN under the plenary powers (3 %)

Example:

- *Galba Schrank*, 1803 (Gastropoda) was established with one species included, *Galba pusilla Schrank*, 1803. This would be the type species by monotypy. In Opinion 1896 (published in 1998) this type fixation was set aside and *Buccinum truncatulum Müller*, 1774 was fixed as type species under the plenary power(s) (now *Galba truncatula*).

Designation under Art. 70.3 (misidentified type species) (1 %)

Examples:

- *Bollingeria Forcart*, 1940 (Gastropoda) was established with its type species *Chondrus pupoides Krynicki*, 1833 proposed by original designation. But Forcart 1940 misidentified the type species and meant *Bulimus lamelliferus Rossmässler*, 1858. It would be convenient to designate *Bulimus lamelliferus* as type species under Art. 70.3.
- *Helisoma Swainson*, 1840 (Gastropoda) was established with one species included, cited by Swainson as "***H. bicarinata Sow. Gen. f. 4***". This suggested that the type species was misidentified, and that *Planorbis campanulatus Say*, 1821 and not *Planorbis bicarinatus Say*, 1819 was meant. But since the incorrect type species *Planorbis bicarinatus* has been regarded as type, it would be convenient to fix this as type under Art. 70.3.

* Basic Operative Principles of ICZN: Principle of Typification

Original designation :

- Type fixation in the original work: **Original designation (31 %)**

Examples:

- Montfort 1810 established the genus *Theodoxus* (Gastropoda) and designated *Theodoxus lutetianus Montfort* 1810 as type species (now *Theodoxus fluviatilis*).
- Vest 1867 established the subgenus *Clausilia (Isabellaria)* (Gastropoda) and designated *Clausilia isabellina Pfeiffer*, 1842 as type species (now *Isabellaria isabellina*).
- Riedel 1987 established the genus *Turcozonites* (Gastropoda) and designated *Zonites wandae Riedel*, 1982 as type species (now *Turcozonites wandae*).

Monotypy (28 %)

Examples:

- *Anodonta Lamarck*, 1799 (Bivalvia) was originally established with one included nominal species, *Mytilus cygneus Linnæus*, 1758. This is the type species fixed by monotypy (now *Anodonta cygnea*).

- *Microcondylaea Vest* 1866 (Bivalvia) was originally established with two included nominal species, *Unio bonellii Férussac*, 1827 and with doubts *Anodonta lata Rafinesque*, 1820. Doubtfully included species do not count, type species is *Unio bonellii* fixed by monotypy (now *Microcondylaea bonellii*).

* Basic Operative Principles of ICZN: Principle of Typification- Contd..

Absolute tautonymy (2 %):

Examples:

- Kobelt, 1871 established the gastropod genus-group name *Candidula* and included 23 species. Among these was *Glischrus candidula Studer* 1820. *Glischrus candidula* is type species fixed by absolute tautonymy (now *Candidula unifasciata).*
- Draparnaud, 1801 established the gastropod genus *Succinea* and included two species, *Succinea amphibia Draparnaud* 1801 and *Succinea oblonga Draparnaud* 1801. Among the synonyms of *S. amphibia*, *Draparnaud* listed a name *Helix succinea Müller* 1774. Synonyms do count here, so *Helix succinea* is type species by absolute tautonymy (now *Succinea putris).*
- Kobelt, 1904 established the gastropod subgenus *Iberus (Balearica*) and included 10 species. Among these was *Helix balearica Rossmässler* 1838, which Kobelt cited as *Iberus (Balearica) balearicus*. The ending -us is irrelevant here, *Helix balearica* is type species by absolute tautonymy (currently *Iberellus balearicus or Iberellus hispanicus*).
- Euxinolauria Lindholm, 1924 (Gastropoda: Lauriidae) was established as a new replacement name for *Caucasica Caziot & Margier,* 1909 (not *Caucasica Boettger,* 1877 (Gastropoda: Clausiliidae)). *Caucasica Caziot & Margier*, 1909 contained originally four species, among which was *Pupa caucasica Pfeiffer*, 1857. This is the type species for *Caucasica Caziot & Margier,* 1909 fixed by absolute tautonymy, and also for Euxinolauria (now *Euxinolauria caucasica*).
- The following **examples do not represent absolute tautonymy**: *Scomber scombrus Linnæus*, 1758 (Actinopterygii), *Babyrousa babyrussa (Linnæus*, 1758) (Mammalia), *Suricata suricatta (Schreber*, 1776) (Mammalia), *Merlangius merlangus (Linnæus*, 1758) (Actinopterygii), *Isabellaria isabellina (Pfeiffer*, 1842) (Gastropoda), *Rupestrella rupestris (Philippi*, 1836) (Gastropoda).

Linnean tautonymy (0.3 %)

Example:

- Linnæus 1758 established *Castor* (Mammalia) and included two species, *Castor fiber* and *Castor moschatus*. Among the synonyms of *Castor fiber* was cited the one-word name Castor with references to six pre-Linnean works (Gesner 1598, Rondelet 1554, Jonston 1650, Dodart 1676, Ray 1693 and Aldrovandi 1649). *Castor fiber Linnæus* 1758 is type species fixed by Linnean tautonymy (now *Castor fiber*).

* Basic Operative Principles of ICZN: Principle of Typification

Linnean tautonymy (0.3 %)

Example:

- Linnæus 1758 established Castor (Mammalia) and included two species, Castor fiber and Castor moschatus. Among the synonyms of Castor fiber was cited the one-word name Castor with references to six pre-Linnean works (Gesner 1598, Rondelet 1554, Jonston 1650, Dodart 1676, Ray 1693 and Aldrovandi 1649). Castor fiber Linnæus 1758 is type species fixed by Linnean tautonymy (now Castor fiber). Subsequent methods of type fixation:

Subsequent monotypy (2 %)

Examples:

- Valvata Müller, 1773 (Gastropoda) was established with a short description and without species. Müller 1774 included one species Valvata cristata Müller 1774. Valvata cristata is type species by subsequent monotypy (now Valvata cristata).
- Omphiscola Rafinesque, 1819 (Gastropoda) was established without species included. Beck 1837 [1838] included one species Buccinum glabrum Müller, 1774. Buccinum glabrum is type species by subsequent monotypy (now Omphiscola glabra).

Subsequent absolute tautonymy (only very few cases)[note 3]

Examples:

- Alosa Garsault, 1764 (Actinopterygii) was established without included species. As first author, Cuvier, 1829 included two species Clupea alosa and Clupea fincta. Type species is Clupea alosa Linnæus 1758 by subsequent absolute tautonymy (now Alosa alosa).
- Rupicapra Garsault, 1764 (Mammalia) was established without included species. As first author, Blainville, 1816 included three species Capra rupicapra Linnæus, 1758, Capra pudu, and Capra americana. Type species is Capra rupicapra by subsequent absolute tautonymy (now Rupicapra rupicapra).

Subsequent Linnean tautonymy (only theoretical, there might be no case)

* Basic Operative Principles of ICZN: Principle of Typification

Subsequent designation (32 %)

Examples:

- Aplexa Fleming, 1820 (Gastropoda) was established with two species, Bulla hypnorum Linnæus, 1758 and Bulla rivalis Turton, 1807. Herrmannsen 1846 fixed Bulla hypnorum as type by subsequent designation (now Aplexa hypnorum).
- Pseudanodonta Bourguignat 1877 (Bivalvia) was established with seven species, Anodonta complanata Rossmässler 1835, and six others. Westerlund 1902 validly designated Anodonta complanata as type species (nowPseudanodonta complanata).
- A species-group name can have a name-bearing type specimen, but this is not a requirement. In many cases species-group names have no type specimens, or they are lost. In those cases the application of the species-group name is usually based on common acceptance. If there is no common acceptance, there are provisions in the Code to fix a name-bearing type specimen that is binding for users of that name. Fixing such a name-bearing type should only be done if this is taxonomically necessary (articles 74.7.3, 75.2, 75.3).

Examples:

- Aptenodytes patagonica Miller, 1778 is either based on a type specimen, perhaps deposited in the Natural History Museum London or somewhere else, or its type is lost. This is now irrelevant because the usage of the name (as Aptenodytes patagonicus) for the king penguin is unambiguously accepted.
- The name-bearing type for Homo sapiens Linnæus, 1758 is deposited in Uppsala (the bones of Carl von Linné). This is a lectotype designated by Stearn 1959, correctly but unnecessarily because the usage of the name was unambiguous at that time, and still is.

* THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE (Art.76-82).

- The duties, power, organisation and operation of the Commission are regulated by Article 76-82 of the code, the constitution of the commission (BZN,21(3):181-185) and the By-laws(BZN,22(1):3-8). Chapter 17 containing Article 77-84m is derived to the section of the nomenclature.
- **The International Commission on the Zoological Nomenclature(ICZN)** is a permanent body which derives all its power from International Congress of Zoology (**Art.76, Status**). The Commission has the power to suspend the applications of any provisions of the Code (Plenary powers, Art.78.1) to suppress or validate any scientific names and to annul or validate any typification, publications or any published matter concerning nomenclature in order to promote stability and continuity in nomenclature (Art.81). The decision of commission of any such particular case referred to it, termed as Opinion (Art.80.2).. The opinions are published in the Bulletin of the Zoological nomenclature by the International Trust of Zoological Nomenclature. Opinions become operative once they are published. Thus commission acts on behalf of the Zoologist and has the power to waive or modify the provisions of their application to a particular case if it is causing any conclusion. The Commission decides suitable action in response to proposal related to nomenclature submitted to it.

Duties of the Commission(Art.77):

- The Commission is charged with the following **duties (Art.77)**-

1. To consider for a period of at least one year in advance of a Congress any proposal for change in the code.,
2. To submit to the congress recommendations for the clarification or modification of the code.
3. To render between successive Congress declaration embodying such recommendations.,
4. To render opinions and direction on questions of zoological nomenclature.
5. To compile the official list of accepted and the official indexes of rejected names and works in zoology.,
6. To submit report to the congress on its work,
7. To discharge such other duties as the congress may determine.

* THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE: CONTD..

Exercise of Power(Art.78):

The commission has the power , when an application is referred to it by any zoologist to interpret the provisions of the code and to apply such interpretation to any questions of zoological nomenclature-A. A.

Declaration:

- If a case before the Commission involves a situation that is not properly or completely covered by the Code then commission is to issue a Declaration. A declaration remains in force until the next succeeding congress ratifies it either in its original form or modified form.

B. **Opinions**-

- If the case in questions involves the application of the code to a particular situation relating to an individual name, act or publications the commission is to render a decision termed as an Opinion.

C. effective date of opinion:

- Opinions have forced immediately upon publication of the ruling of the Commission and are to be reported to the next succeeding congress.

D. Directions:-

- Decisions completely earlier ruling and formal instruments required under automatic provision of the code , are called Directions. They have the same status as the opinions.

* THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE: CONTD..

E. Construction:

- All decisions are to be rigidly construed and no conclusion other than those expressly specified are to be drawn from them.

F. Official Lists and Indexes:-

- Names and works that are accepted or rejected in opinions are to be entered on the relevant Official Lists or Indexes where upon the opinion concerned are deemed repealed for all except historical purposes.

G. Review by Congress of Commission's decision:

- A motion to modify or reject any decision of the Commission is not to be considered by a Congress until notice of at least one year has been given to the Commission.

Plenary power (Art.79):

- The Commission is empowered to suspend on due notice as prescribed by its constitution the application of any provision s of the Code except those in the present and the next succeeding chapter , if such application to a particular case would in its judgment disturb stability or universality or cause confusion.
- For the purpose of preventing such disturbances and of promoting a stable and universally accepted nomenclature, it may under these plenary powers, annual or validate any name, type, designation or other published nomenclatural act or any publications and validate or establish replacements.

* THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE: CONTD..

Guiding principles:

- In exercising its plenary power the commission is to be guided as follows :

1. A name supressed so as to validate the use of the same name published at alternate in another sense, is to be supressed for the purposes both of the law of priority and of the law of homonymy.

2. A name suppressed so as to validate a later name given to the same taxon is to be supressed for the purpose of the law of the priority but not for those of law of homonymy.

3. If the commission refuse to use its plenary power in a given case the opinion rendered is to specify the name(s) to be used in the case in question and the action if any, to be taken.

Status of case under consideration(Art.80):

- when a case is under consideration by the commission existing usage is to be maintained until the decision of the Commission is published.

Exemption(Art.81):

- The Commission is under no obligation to search out the violation of the Code, or to supplement or verify information contained in applications submitted to it or to initiate any action within its field of competence although, it may, at its discretion, do any of these things.

Constitution and By- laws (Art.82):

- Change in the commission can be made only by the Congress on recommendation by the commission, in the same manners as the amendments to the code(Art.87).
- Changes in the by- laws can be made by the commission under procedure set-forth in the commission.

ICZN: APPENDICES TO THE CODE

- Attached to the code, there are five appendices to serve as a guide to good usage in nomenclature. They are not mandatory, rather have the same status as recommendations in the code. There are five appendices in the ICZN.

Appendix A:

- **Appendix A** (Code p.93) is the code of ethics . Every Zoologist, taxonomist in particular should be aware of the eight paragraphs of this appendix in order to avoid any kind of violation to well established conventions and risks losing the respect of his colleagues. For instance, no zoologist should publish a replacement name for a junior homonym during the life-time of its author following the procedure of paragraph 3 of the code of Ethics.

Appendix B:

- **Appendix B** deals with the transliteration and latinization of Greek words (code, pp.95-101).

Appendix C:

- **Appendix C** deals with the latinization of the geographical and proper names (code, pp101-103).

Appendix D:

- **Appendix D** contains extraordinarily detailed and helpful recommendations on the formation of the names(code, pp.105-141).

Appendix E:

- **Appendix E** (code, pp.143-147) contains usefull summary of the recommendations to the working taxonomists. There are altogether 24 recommendations, out of which recommendation number 15,16, 22 and 24 are of prime importance .

ICZN: GLOSSARY AND INDEX

- The Glossary is the concluding part of the International Code of Zoological Nomenclature. It probably explains the meanings of literally all technical words used in the code.

- If a zoologist is in doubts to the meaning of the word used in the code, he/she should consult the glossary to be found on pp.148-154 (English) and pp.155-161 (French).

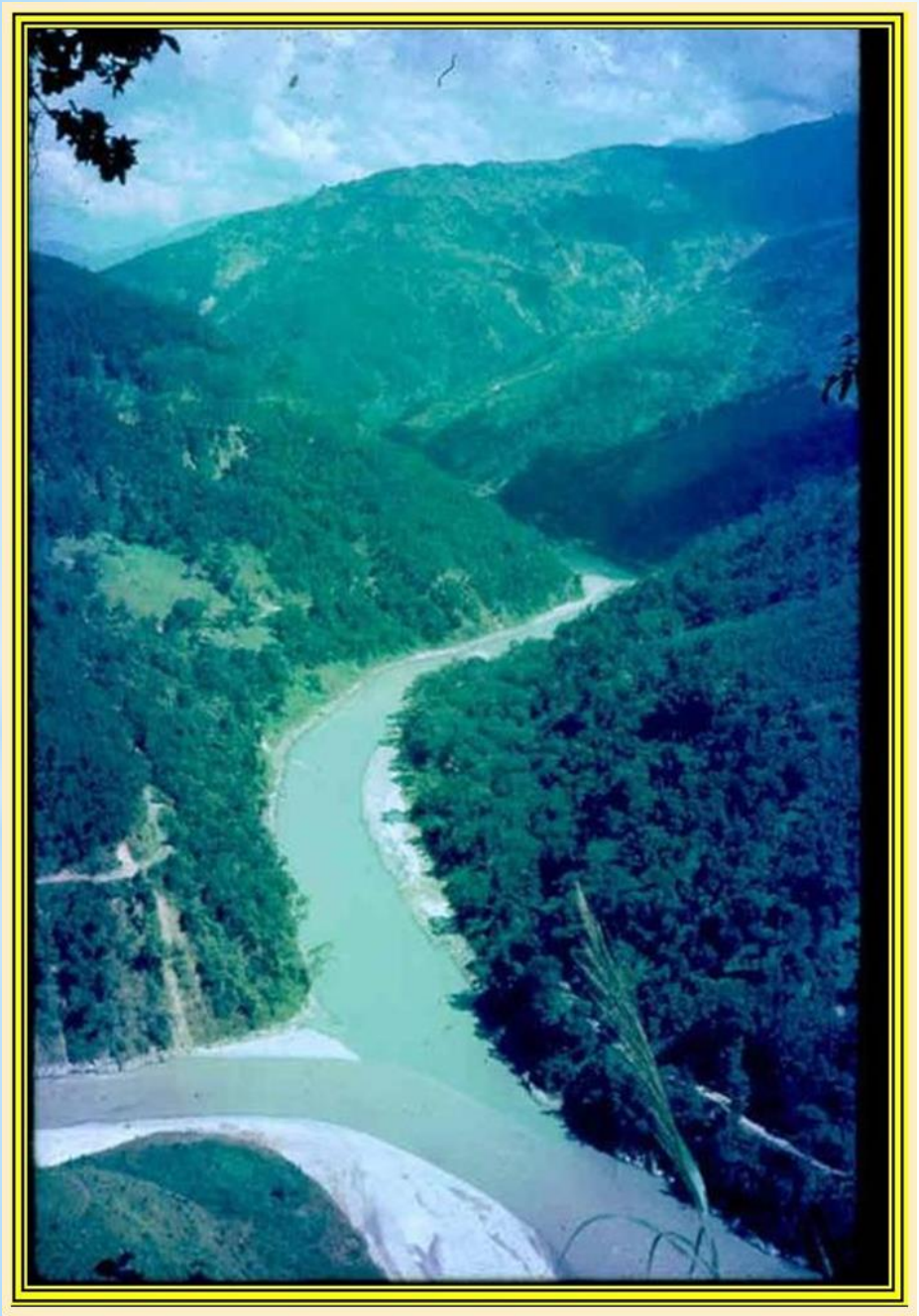
- Even though there are only 87 articles in the ICZN, but there are over 600 individual provisions in this code and in the appendices (exclusive of the table).

- The index of the code (pp.163-176) is an individual guide to these provisions. Items printed in bold face in the index refer to the Glossary.

Conclusion

- The International Code of Zoological nomenclature provides the three specific characteristics to the scientific nomenclature as- uniqueness, universality and stability.
- These three major objectives of the communication has already been included in the preamble of the code
- 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 decided first by applying the code directly, and not by reference to precedent.

- The code is also retroactive or retrospective, which means that previous editions of the code, or previous other rules and conventions have no force any more today and the nomenclatural acts published 'back in the old times' must be evaluated only under the present edition of the code.
- In cases of disputes concerning the interpretation, the usual procedure is to consult the French Code, lastly a case can be brought to the commission who has the right to publish a final decision.
- Hence the establishment of the code may be considered as the land mark in the history of taxonomy.



THANK YOU