Nomenklatur und Taxonomie

ein “how to” and “what is” guide

Mathias Harzhauser & Andreas Kroh

Taxonomy

Ancient Greek:
τάξις taxis = arrangement, Ordnung
νομία nomia = method, rule, Gesetz

Taxonomy can be defined as the study of classification including its principles, procedures and rules.

Doing taxonomy means identifying, describing and naming taxa.

Taxonomy

systematically arranged but without any nomenclature

Taxonomy

nomen applied: Paprika gelber Paprika Blockpaprika Gemüsepaprika

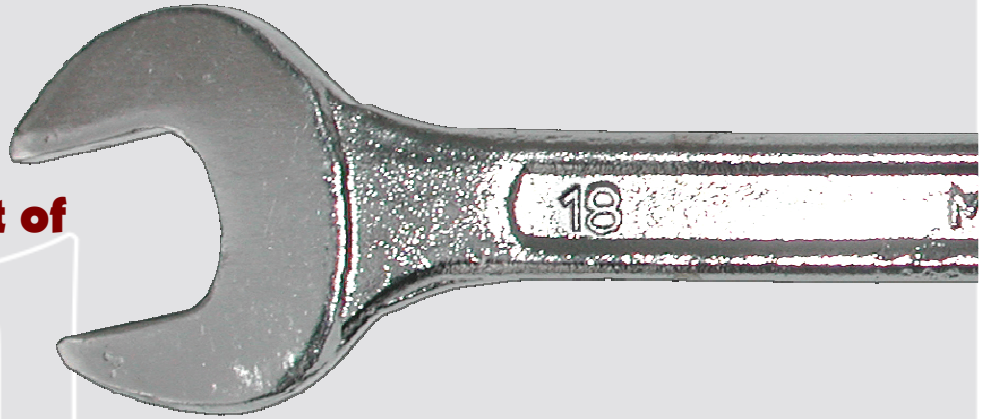
Nomenclature

In biological science nomenclature is regarded as a part of taxonomy.

nomenclature, in this strict scientific sense, is that branch of taxonomy concerned with the application of scientific names to taxa, based on a particular classification scheme and in accordance with agreed international rules and conventions.

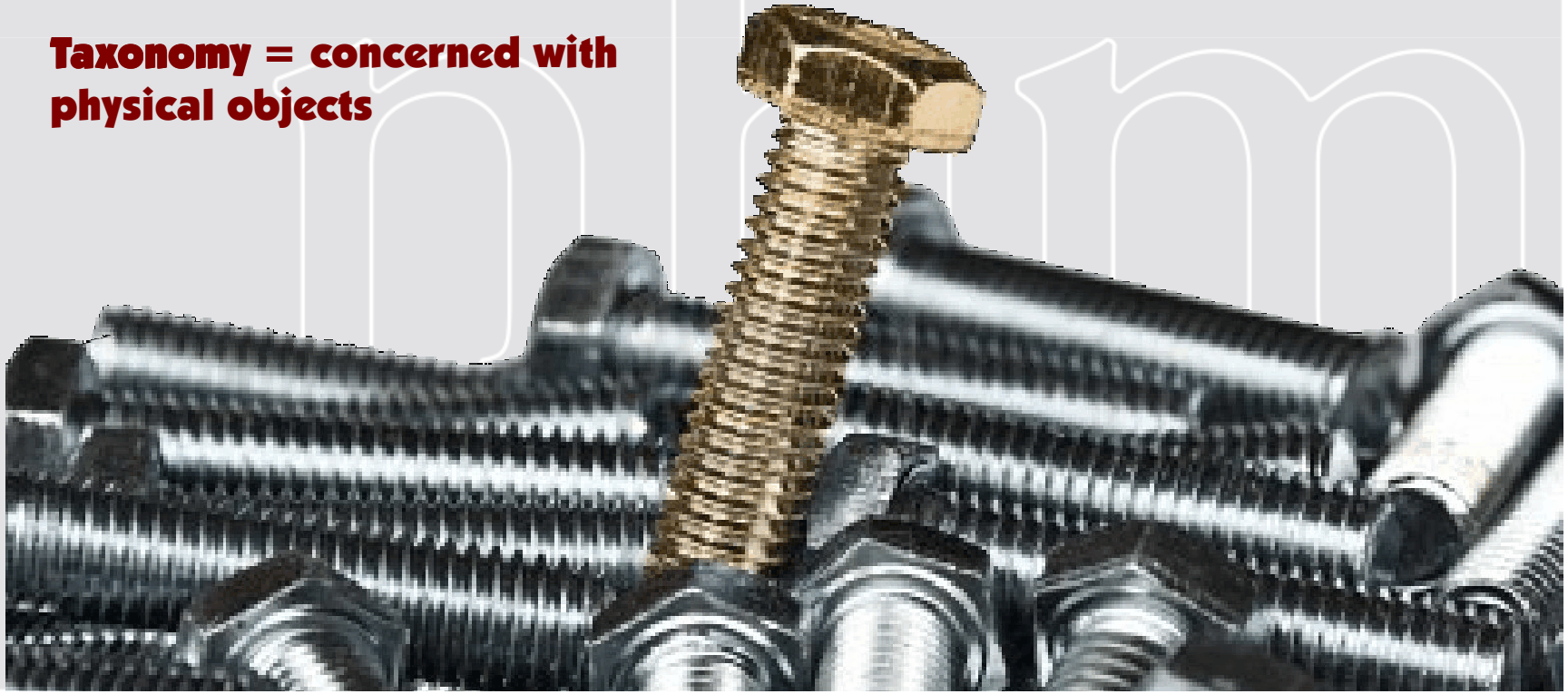
Nomenclature

in short:



Nomenclature = a theoretic set of tools and rules how to apply these

Taxonomy = concerned with physical objects



the starting point

Aristotle (384-322 BC) was the first to attempt to classify all the kinds of animals. He grouped the types of creatures according to their similarities.

Aristotle's view of life was hierarchical. He assumed that creatures could be grouped in order from lowest to highest, with the human species being the highest.

This view persisted for the next two thousand years.

the dawn of the modern age

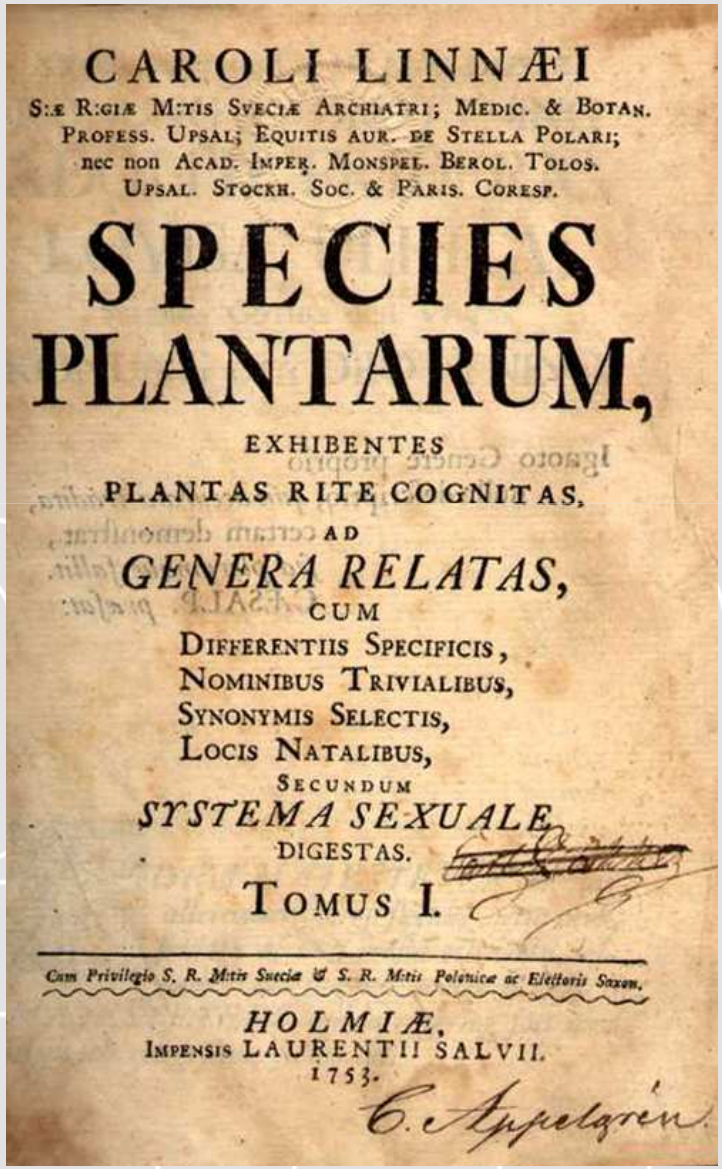
Carl Linnaeus (23 May 1707 – 10 January 1778) was a Swedish botanist, physician, and zoologist, who laid the foundations for the modern scheme of binomial nomenclature.

He is known as the father of modern taxonomy.

the dawn of the modern age

Species Plantarum ("The Species of Plants") was first published in 1753, as a two-volume work by Carl Linnaeus.

It is the primary starting point of plant nomenclature as it exists today.
= the first names to be considered validly published in botany



CAROLI LINNÆI

S:æ R:giæ M:tis Sveciæ Archiatri; Medic. & Botan. Profess. Upsal; Equitis aur. de Stella Polari; nec non Acad. Imper. Monspel. Berol. Tolos. Upsal. Stockh. Soc. & Paris. Coresp.

SPECIES PLANTARUM,

EXHIBENTES
PLANTAS RITE COGNITAS,
AD
GENERA RELATAS,
CUM
DIFFERENTIIS SPECIFICIS,
NOMINIBUS TRIVIALIBUS,
SYNONYMIS SELECTIS,
LOCIS NATALIBUS,
SECUNDUM
SYSTEMA SEXUALE
DIGESTAS.

TOMUS I.

Cum Privilegio S. R. M:tis Sueciæ & S. R. M:tis Poloniæ ac Electoris Saxon.

HOLMIÆ,
IMPENSIS LAURENTII SALVII.
1753.

the dawn of the modern age

Linnaeus gave a formal multiple-word description and an additional epithet to be used with the genus for easier reference, thus separating taxonomy from nomenclature.

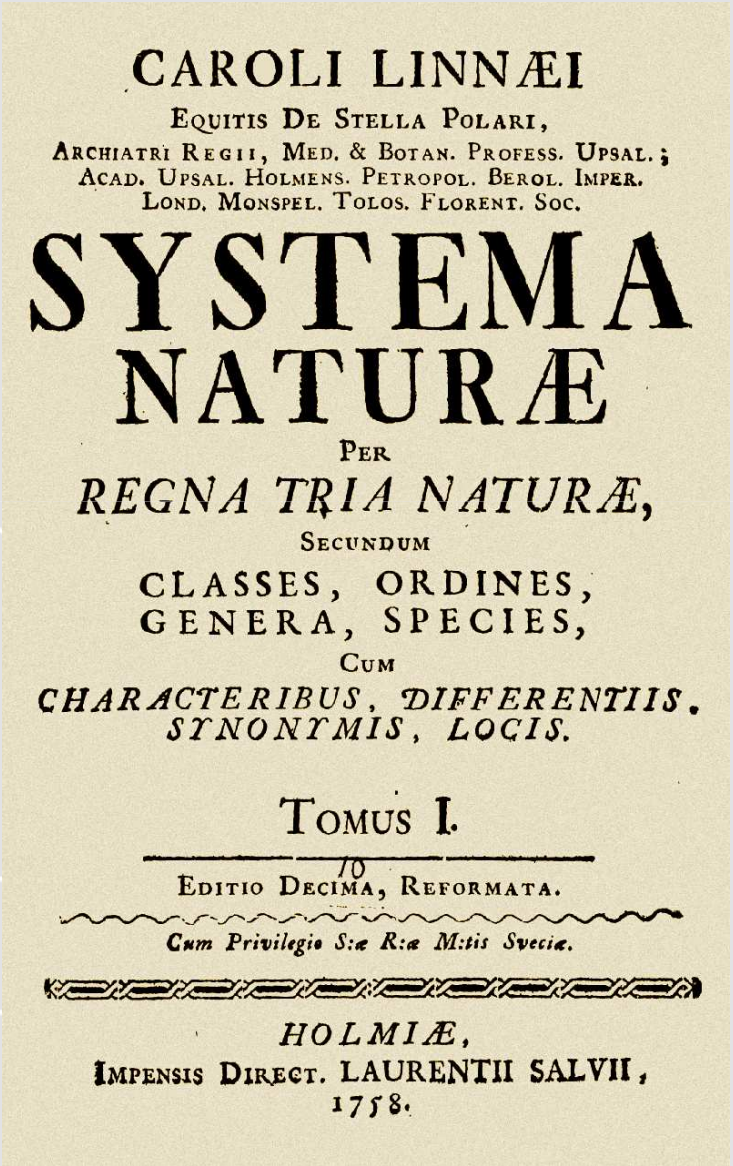
For example, the tomato was described as **SOLANUM** caule inermi herbaceo foliis pinnatis incisis, racemis simplicibus. The given epithet was Lycopersicum.

The binary name
Solanum lycopersicum
very soon took over in usage because of its brevity, and the multiple-word definitions were no longer treated as formal names.

the dawn of the modern age

The book Systema Naturæ was one of the major works of Linnaeus. The first edition was published in 1735.

The tenth edition of this book is considered the starting point of zoological nomenclature.



CAROLI LINNÆI

EQUITIS DE STELLA POLARI,
ARCHIATRI REGII, MED. & BOTAN. PROFESS. UPSAL.;
ACAD. UPSAL. HOLMENS. PETROPOL. BEROL. IMPER.
LOND. MONSPEL. TOLOS. FLORENT. SOC.

SYSTEMA NATURÆ

PER

REGNA TRIA NATURÆ,

SECUNDUM

CLASSES, ORDINES,
GENERA, SPECIES,

CUM

CHARACTERIBUS, DIFFERENTIIS,
SYNONYMIS, LOCIS.

TOMUS I.

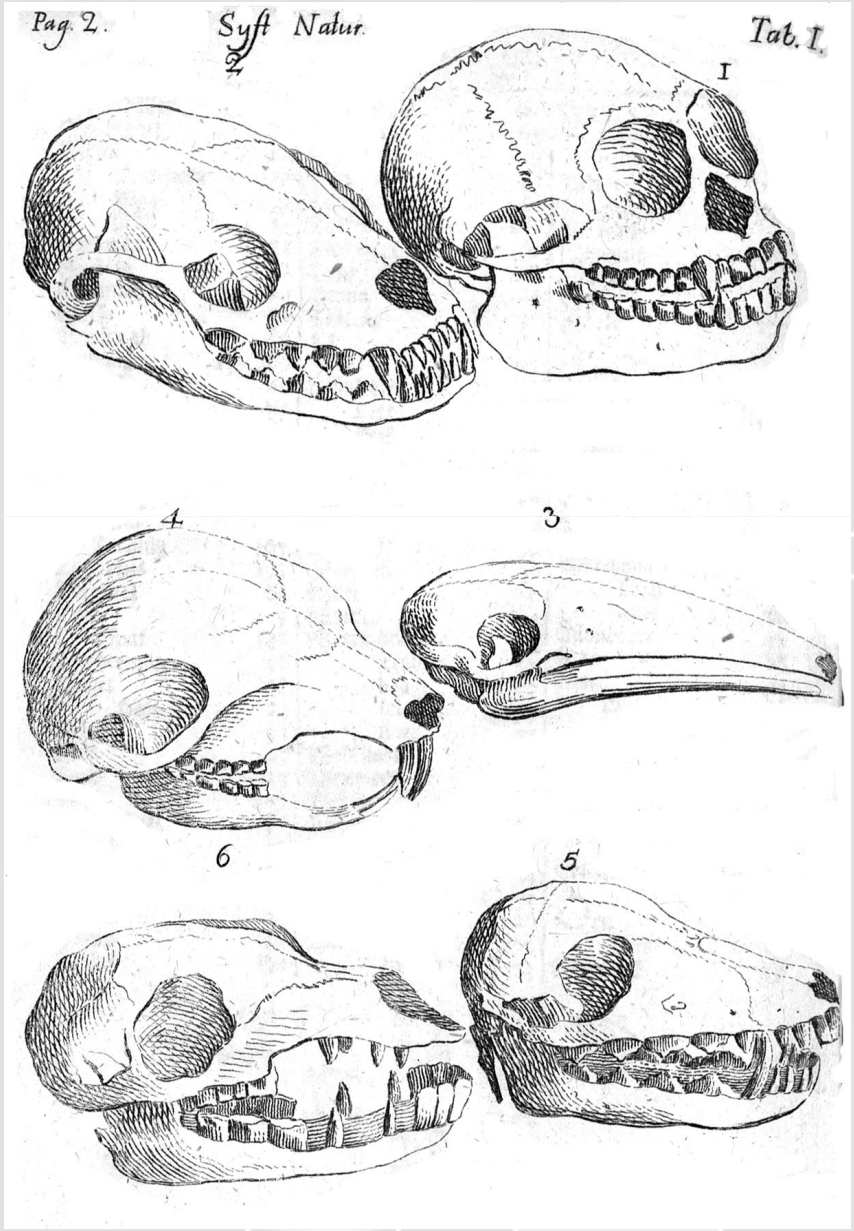
10

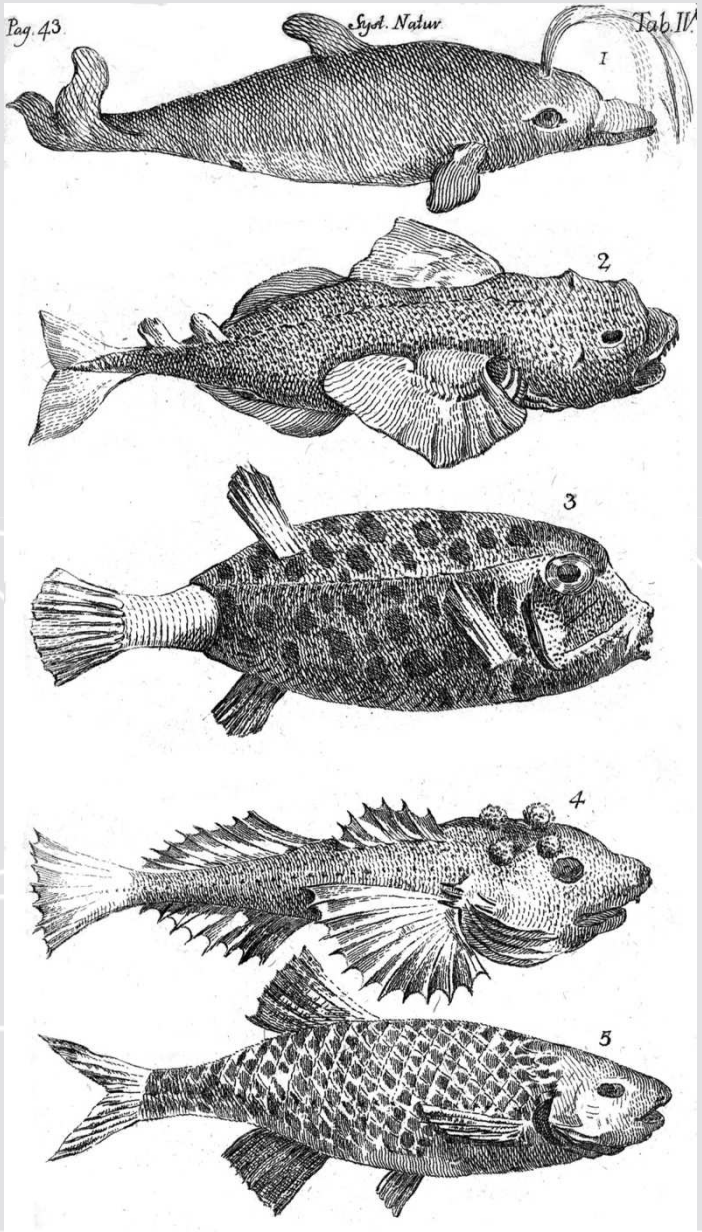
EDITIO DECIMA, REFORMATA.

Cum Privilegio S:æ R:æ M:tis Sveciæ.

HOLMIÆ,
IMPENSIS DIRECT. LAURENTII SALVII,
1758.

the dawn of the modern age





Nomenclature

At the time of Linnaeus only about 10,000 species of organisms were recognised by science, about 6,000 species of plants and 4,236 species of animals.

starting point of binomial nomenclature

Nomenclature

Binomial nomenclature

is a formal system of naming species by giving each a name composed of two parts, both of which use Latin grammatical forms, although they can be based on words from other languages.

The first part of the name identifies the genus to which the species belongs.

The second part identifies the species within the genus.

official codes

official codes

International Code of Nomenclature for algae, fungi, and plants

International Code of Nomenclature of Bacteria

International Code of Nomenclature for Cultivated Plants

International Code of Zoological Nomenclature

International Code of Nomenclature of Bacteria

The International Code of Nomenclature of Bacteria (ICNB) or Bacteriological Code (BC) governs the scientific names for bacteria, including Archaea.

It denotes the rules for naming taxa of bacteria, according to their relative rank.

List of Prokaryotic names with Standing in Nomenclature (LPSN) is an online database that maintains and provides accurate name (nomenclature and taxonomy) and related information of prokaryotes according to the International Code of Nomenclature of Bacteria

International Code of Nomenclature for Cultivated Plants

The International Code of Nomenclature for Cultivated Plants (ICNCP) regulates the names of cultigens (= plants whose origin or selection is primarily due to intentional human activity).

Int. Code of Nomencl. for algae, fungi, and plants (ICN)

The International Code of Nomenclature for algae, fungi, and plants (ICN) is the set of rules and recommendations dealing with the formal botanical names that are given to plants, fungi and a few other groups of organisms, all those "traditionally treated as plants".

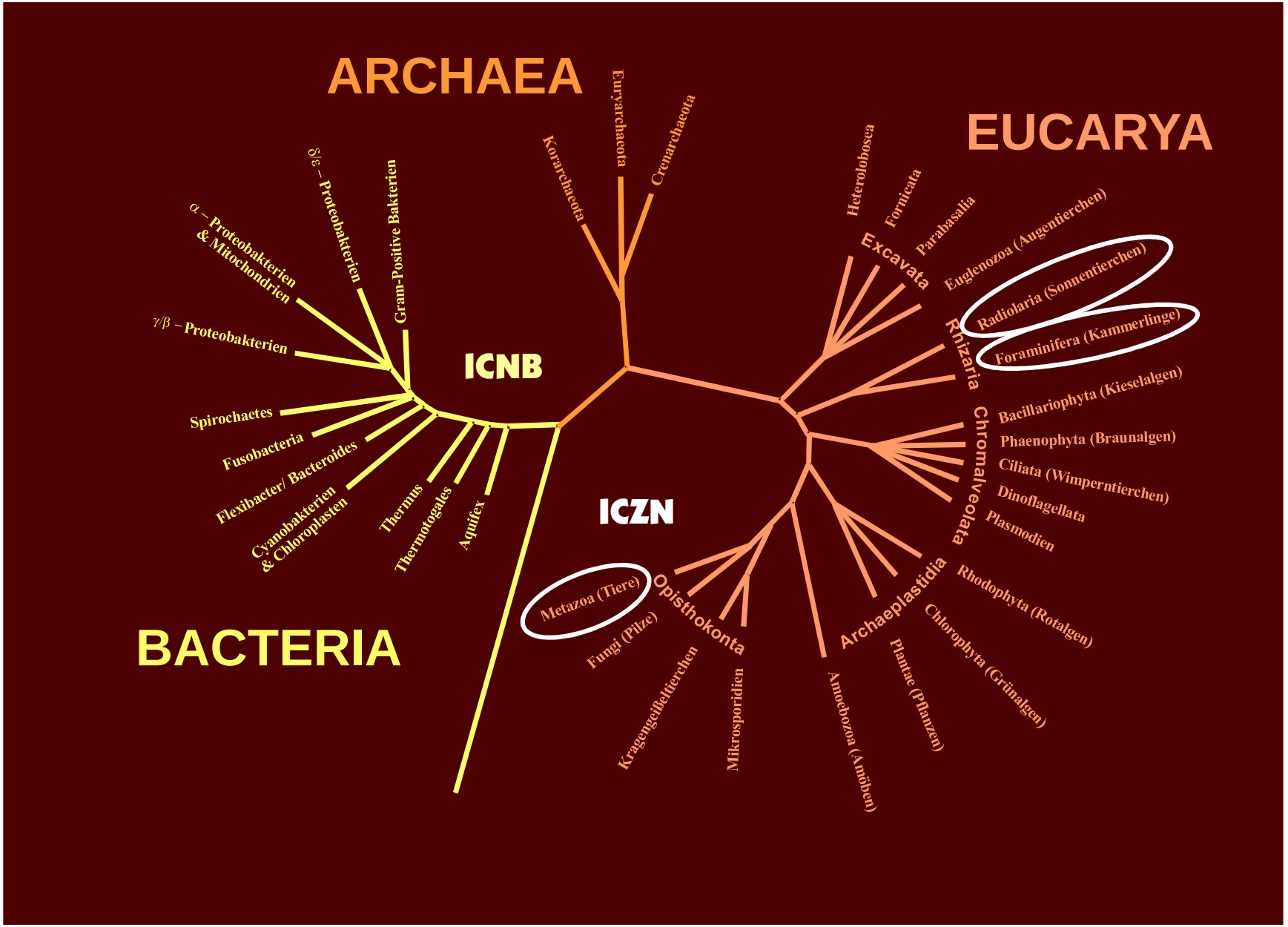
It was formerly called the International Code of Botanical Nomenclature (ICBN); the name was changed at the International Botanical Congress in Melbourne in July 2011 as part of the Melbourne Code which replaces the Vienna Code of 2005.

Int. Code of Nomencl. for algae, fungi, and plants (ICN)

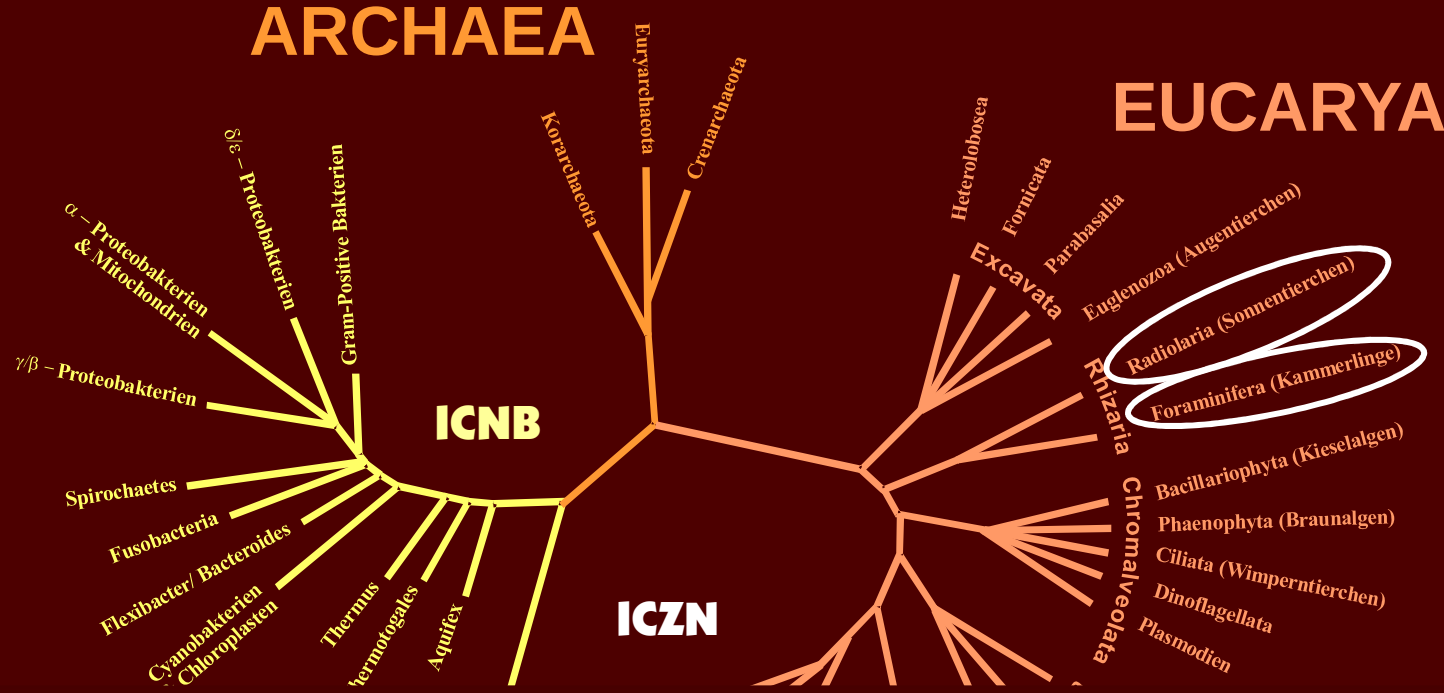
The name of the Code is partly capitalized and partly not. The lower-case for "algae, fungi, and plants" indicates that these terms are not formal names of clades, but indicate groups of organisms that were historically known by these names and traditionally studied by botanists, mycologists, and phycologists.

This includes blue-green algae (Cyanobacteria); fungi, including chytrids, oomycetes, and slime moulds; photosynthetic protists and taxonomically related non-photosynthetic groups.

International Codes of Nomenclature



International Codes of Nomenclature



Die Autoren, die sich mit parasitischen Taxa beschäftigen (also: Leishmanien, Trypanosomen, Mikrosporidien) verwenden den Zoologischen Code, aber nur, weil die Autoren selbst, also die Parasitologen meist aus der Zoologie kommen. Die Freiland-Protozoologen hingegen verwenden meist den Algen-Code. Die Mikrosporidien müßten korrekterweise auch tatsächlich mit dem Algen-Pilz-Code behandelt werden, da man ja seit einigen Jahren weiß, daß es sich um Pilze handelt. Aber bei den Excavata und auch den Alveolata, etc. herrscht (derzeit noch) reine Willkür.

International Codes of Nomenclature

TAXON 60 (1) • February 2011: 1–14

Introducing the *Draft BioCode* (2011)

David L. Hawksworth

Chair, IUBS/IUMS International Committee on Bionomenclature; Departamento de Biología Vegetal II, Facultad de Farmacia, Universidad Complutense de Madrid, Plaza Ramón y Cajal, Madrid 28040, Spain; and Department of Botany, Natural History Museum, Cromwell Road, London SW7 5BD, U.K.; d.hawksworth@nhm.ac.uk

As information on the world's biota becomes increasingly integrated across different groups of organisms, from bacteria and fungi to animals and plants, there is a concomitant rising need for a consistent and harmonized approach to the regulation of scientific names. The *BioCode* initiative represents a concerted effort, by biologists intimately involved in the operation of the current system of separate codes, to devise a unified approach to the future naming of organisms of all kinds. This need has become pressing in view of common issues that the separate organismal type-based codes now have to address, consequent on the rapid changes taking place in global informatics, database architecture, molecular systematics and ecology, and electronic publication.

The *Draft BioCode* (2011) is most appropriately viewed as a framework over-arching the practices of the current series of codes, but which also addresses ways in which some of the key issues of current concern in systematics could be handled by all codes, for example the registration of new names and electronic publication. In addition, it has been drawn up so that its provisions can be adopted at the appropriate time for any

codes. An exploratory meeting on harmonization between the codes was then convened in Egham (U.K.) in 1994; this was held under the auspices of IUBS, IUMS (International Union of Microbiological Societies) and IAPT with support from CAB International, the Linnean Society of London, and the Royal Society of London. It set an agenda for future action in biological nomenclature, including the establishment of what became the IUBS/IUMS International Committee on Bionomenclature (ICB) following the 25th IUBS General Assembly in Paris (France) later in 1994. The ICB addressed several issues of concern when it met in Egham the following year, but also generated a first draft of a prospective *International code of bionomenclature*. That document was developed and presented at ICSEB V in Budapest in 1996, as the *Draft BioCode: The prospective international rules for the scientific naming of organisms*. Having taken note of debates during that congress, the ICB met again at Egham in 1997 and then issued a revision, the *Draft BioCode* (1997).

The *BioCode* was, from the first, seen as something to deal with names proposed in the future, while the existing separate

International Codes of Nomenclature

TAXON 60 (1) • February 2011: 1–14

Introducing the *Draft BioCode* (2011)

David L. Hawksworth

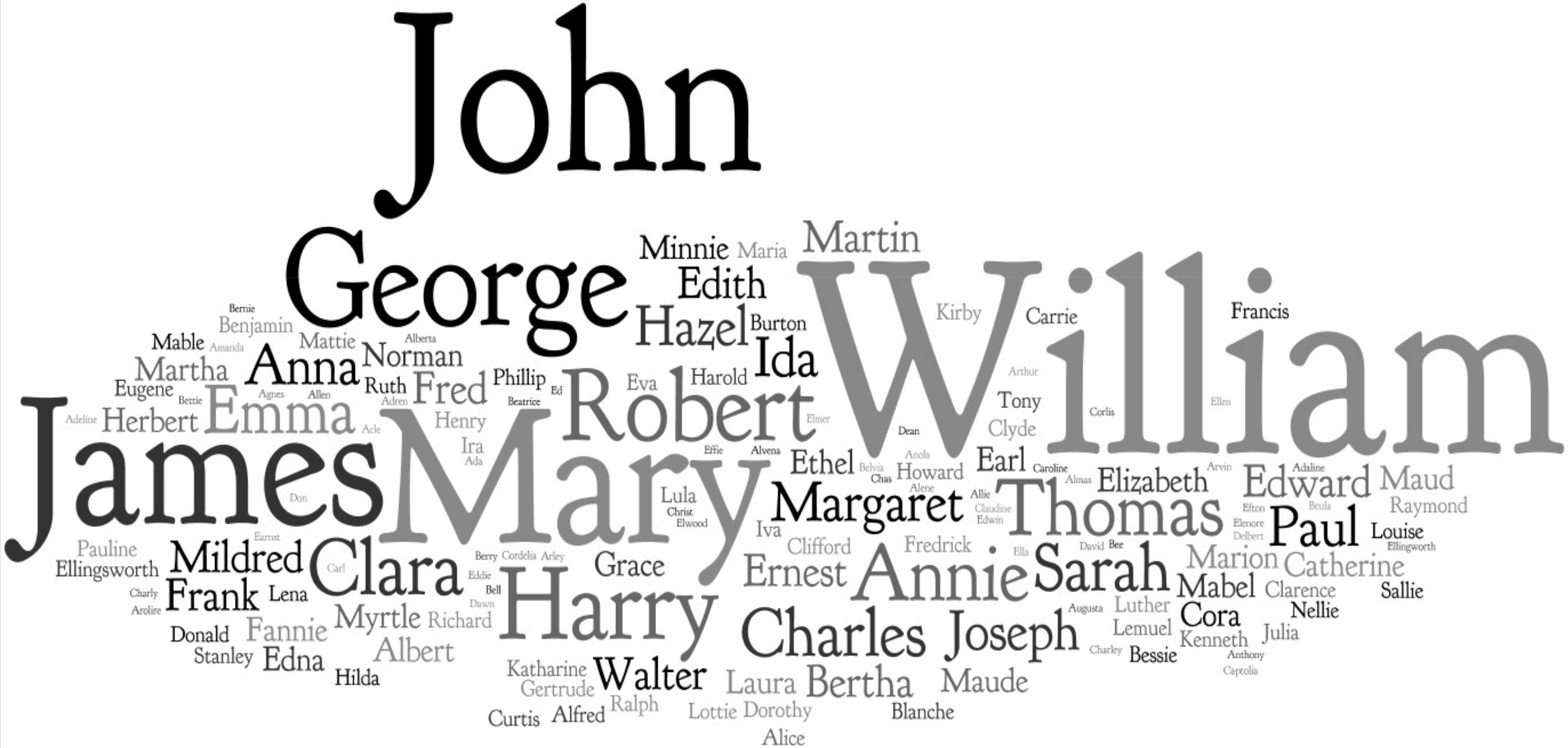
Not yet complete – i. e. missing articles (e. g. Article 13.2 relating to mandatory name registration)

Aims to unify the different Codes and to avoid homonymy at all ranks & to harmonize higher taxon names.

Implications: Massive changes of higher taxa names necessary.

Phylum Echinodermata → Echinozoa (now a subphyllum name in use)
Class Echinoidea → Echinopsida [ending *–opsida*]
Subclass Vetigastropoda → Vetigastrozoidae [ending *–zoidae*]
Order Neogastropoda → Neogastrales [ending *–ales*]
Suborder Clypeasterina → Clypeasterineae [ending *–ineae*]

Names


John
William
Mary
James
George
Robert
Thomas
Harry
Charles
Joseph
Annie
Sarah
Margaret
Clara
Anna
Emma
Martin
Edith
Hazel
Minnie
Maria
Ida
Kirby
Carrie
Francis
Burton
Harold
Eva
Phillip
Fred
Norman
Ruth
Mattie
Benjamin
Mable
Martha
Eugene
Herbert
Henry
Ira
Tony
Clyde
Earl
Ethel
Howard
Elizabeth
Edward
Maud
Raymond
Paul
Louise
Marion
Catherine
Clarence
Sallie
Mabel
Nellie
Cora
Kenneth
Julia
Luther
Lemuel
Bessie
Mildred
Pauline
Ellingsworth
Frank
Lena
Myrtle
Richard
Fannie
Donald
Stanley
Edna
Albert
Hilda
Grace
Ernest
Clifford
Fredrick
Iva
Lula
Katharine
Gertrude
Walter
Laura
Bertha
Maude
Blanche
Curtis
Alfred
Ralph
Lottie
Dorothy
Alice

Names

Genus (Subgenus) species subspecies **Author, year of publication**

In modern usage, the first letter of the genus, is always capitalized, while that of the second part is not, even when derived from a proper noun such as the name of a person or place.

e.g.: *Medusaceratops lokii* Ryan, Russell & Hartman, 2010

Names

Genus (Subgenus) species subspecies **Author, year of publication**

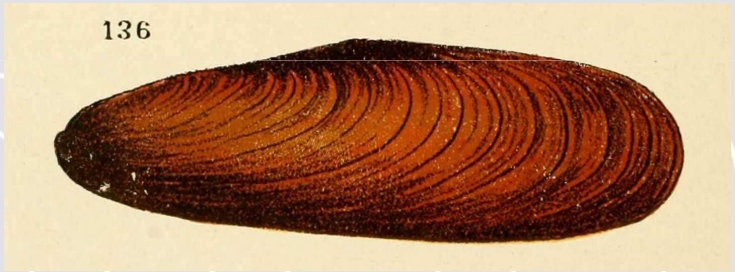
how to form the endings?

Names

Article 30.

a genus-group name that is or ends in a Latin word takes the gender given for that word in standard Latin dictionaries;

if it is a compound word formed from two or more components, the gender is given by the final component



e.g.:
***Felis*, feminine**
***Salmo, Ursus*, masculine**

***Argonauta*, masculine from the final noun nauta (a sailor)**
***Lithodomus*, feminine from the final noun domus (a home)**
***Anser* (a goose), masculine, as are names ending in it**

***Anseranas*, feminine (a compound name of two nouns: Anser, masculine, but the final noun anas (a duck) is feminine)**

Names

Article 30.

a genus-group name that is or ends in a Greek word transliterated into Latin without other changes takes the gender given for that word in standard Greek dictionaries;

e.g.:
-*ornis* (ornis), is masculine;
***Lepas* (lepas) is feminine;**
***Diadema* (diadema) is neuter.**

Names ending in -*caris* (caris), -*gaster* (gaster), -*lepis* (lepis), or -*opsis* (opsis) are feminine;

names ending in -*ceras* (keras), -*nema* (nema), -*soma* (soma), or -*stoma* (stoma) are neuter.

Names

The second part of the name, which identifies the species within the genus, is also treated grammatically as a Latin word.

The second part of a binomial may be an adjective. The adjective must agree with it in gender: masculine, feminine or neuter

Some common endings for Latin adjectives in the three genders are

-us,	***-a,***	***-um***
-is,	***-is,***	***-e*** **(e. g. tristis)**
or,	***-or,***	***-us*** **(e. g. minor)**

Naming species: persons

Article 31. Species-group names

Species-group names formed from personal names.

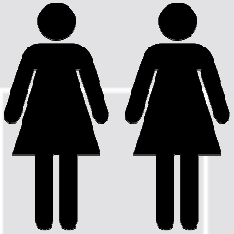
A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name

-*i* if the personal name is that of a man

-*orum* if of men or of man (men) and woman (women) together,

-*ae* if of a woman

-*arum* if of women



Naming species: persons

End on *–i, –ii, –ae, –orum, –arum* ....
Respect the gender of the Person!

named after a man – Max Mustermann:
Conus mustermanni
Conus maxmustermanni

named after a woman– Michaela Mustermann:
Conus mustermannae
Conus michaelamustermannae

named after a couple – Fam. Mustermann:
Conus mustermannorum

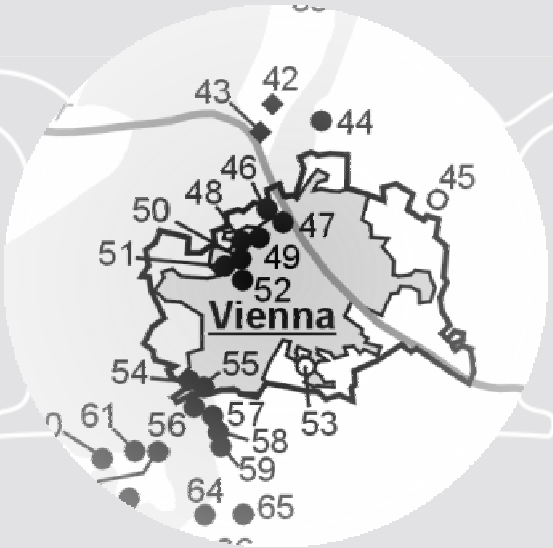
Naming species: places

End on *–ensis, –ense*
Respect the gender of the genus name!

masculine – e. g.: *Conus*
Conus viennensis

feminine – e. g.: *Handmannia*
Handmannia viennensis

neuter – e. g.: *Diadema*
Diadema viennense



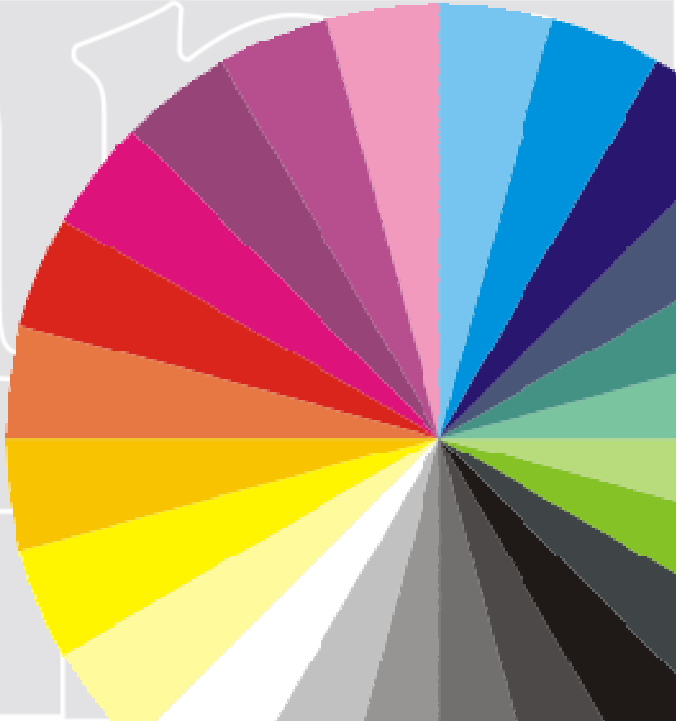
Naming species: attributes

End on *–us, –a, –um*
Respect the gender of the genus name!

masculine – e. g. : albus [Lat.] = white
Conus albus

feminine – e. g.: albus [Lat.] = white
Handmannia alba

neuter – e. g.: albus [Lat.] = white
Diadema album



Naming species: objects

If the species name is formed from a noun in apposition, the gender of the genus name is ignored!

e. g.: cidaris [Lat.] = turban
Conus cidaris

e. g.: pileus [Lat.] = lance
Handmannia pileus

e. g.: diadema [Lat.] = crown
Echinus diadema

Naming species: objects

The second part of a binomial may be a noun in the nominative case. An example is the binomial name of the lion, which is *Panthera leo*.

Grammatically the noun is said to be in apposition to the genus name and the two nouns do not have to agree in gender; in this case, *Panthera* is feminine and *leo* is masculine.

Names

The sex of the genus is relevant in most cases!

case 1: genus is feminine (*Turritella*)

species name used as an adjective: *Turritella maculata*

referring to geography: *Turritella clarionensis*

Names

The sex of the genus is relevant in most cases!

case 2: genus is masculine (*Zeacumantus*)

species name used as an adjective: *Zeacumantus bicarinatus*

referring to geography: *Zeacumantus diemenensis*

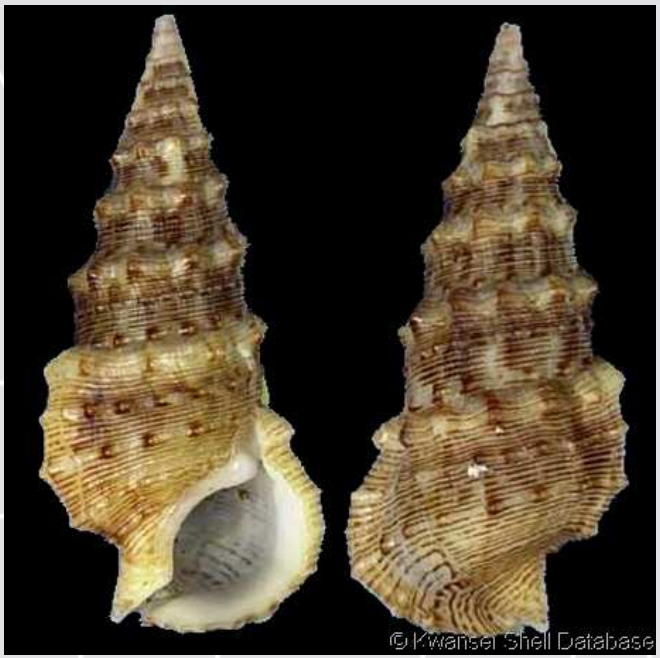
Names

The sex of the genus is relevant in most cases!

case 3: genus is neuter (*Cerithium*)

species name used as an adjective: *Cerithium nodulosum*
Cerithium suturale

referring to geography:
Cerithium nicaraguense



Names

Whereas the first part of a binomial name must be unique within a kingdom, the second part is quite commonly used in two or more genera. The full binomial name must be unique within a kingdom.

Pantholops hodgsonii

Magnolia hodgsonii

Anthus hodgsoni

Names

Acanthurus lineatus

Uroplatus lineatus

Stenobothrus lineatus

Uroplectes lineatus

Plotosus lineatus

Stemonyphantes lineatus

Names

It is obligatory to match the species' gender with the genus' gender.

For example note how the species name of the guppy changed when it was reclassified from *Lebistes reticulatus* to *Poecilia reticulata*.

Naming species: corrections

Erroneously declined names need to be corrected.
e. g.: *Conus alba* → *Conus albus*

Invalid characters (diacritic signs) must be replaced
e. g.: *Scutella höberthi* → *Scutella hoebarthi*

Exception: *-i, -ii*
Usually an ending both on *–i,* as well as *–ii* is technically correct (if the name is Latinized) Here the original spelling is to be used. Any corrections wether intentional or not are considered unjustified emendations.

The Code
33.4. Use of *-i* for *-ii* and vice versa, and other alternative spellings, in subsequent spellings of species-group names. The use of the genitive ending *-i* in a subsequent spelling of a species-group name that is a genitive based upon a personal name in which the correct original spelling ends with *-ii*, or vice versa, is deemed to be an incorrect subsequent spelling, even if the change in spelling is deliberate; the same rule applies to the endings *-ae* and *-iae*, *-orum* and *-iorum*, and *-arum* and *–iarum*.

Authority

Authority

When the original name is changed, e.g. the species is moved to a different genus, all codes use parentheses around the original authority; the ICN also requires the person who made the change to be given. Some examples:

***Amaranthus retroflexus* Linnaeus**
the absence of parentheses shows that this is his original name.

***Hyacinthoides italica* (Linnaeus) Rothmaler**
Linnaeus first named the Italian bluebell *Scilla italica*; Rothmaler transferred it to the genus *Hyacinthoides*.

Authority

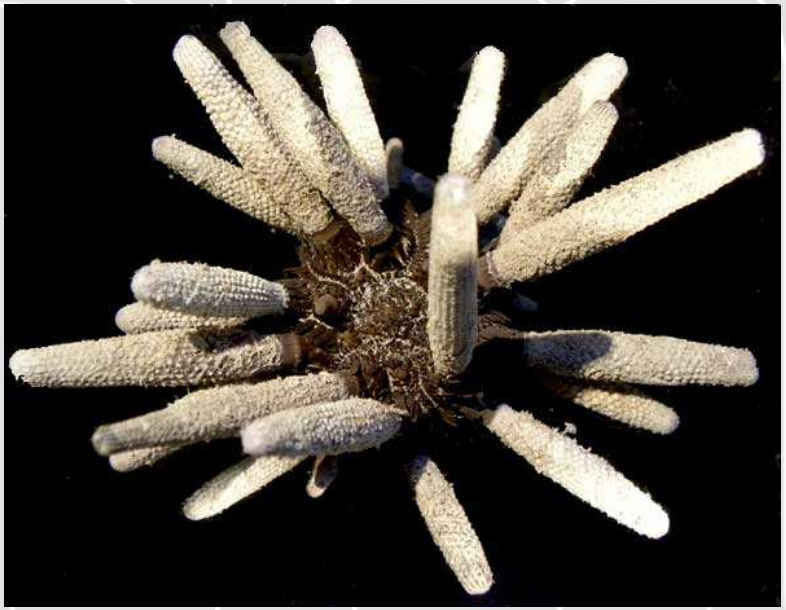
Passer domesticus **(Linnaeus, 1758)**

the original name given by Linnaeus was *Fringilla domestica*; unlike the ICN, the ICZN does not require the name of the person who changed the genus to be given.

Authority: "Meier in Müller, 1999"

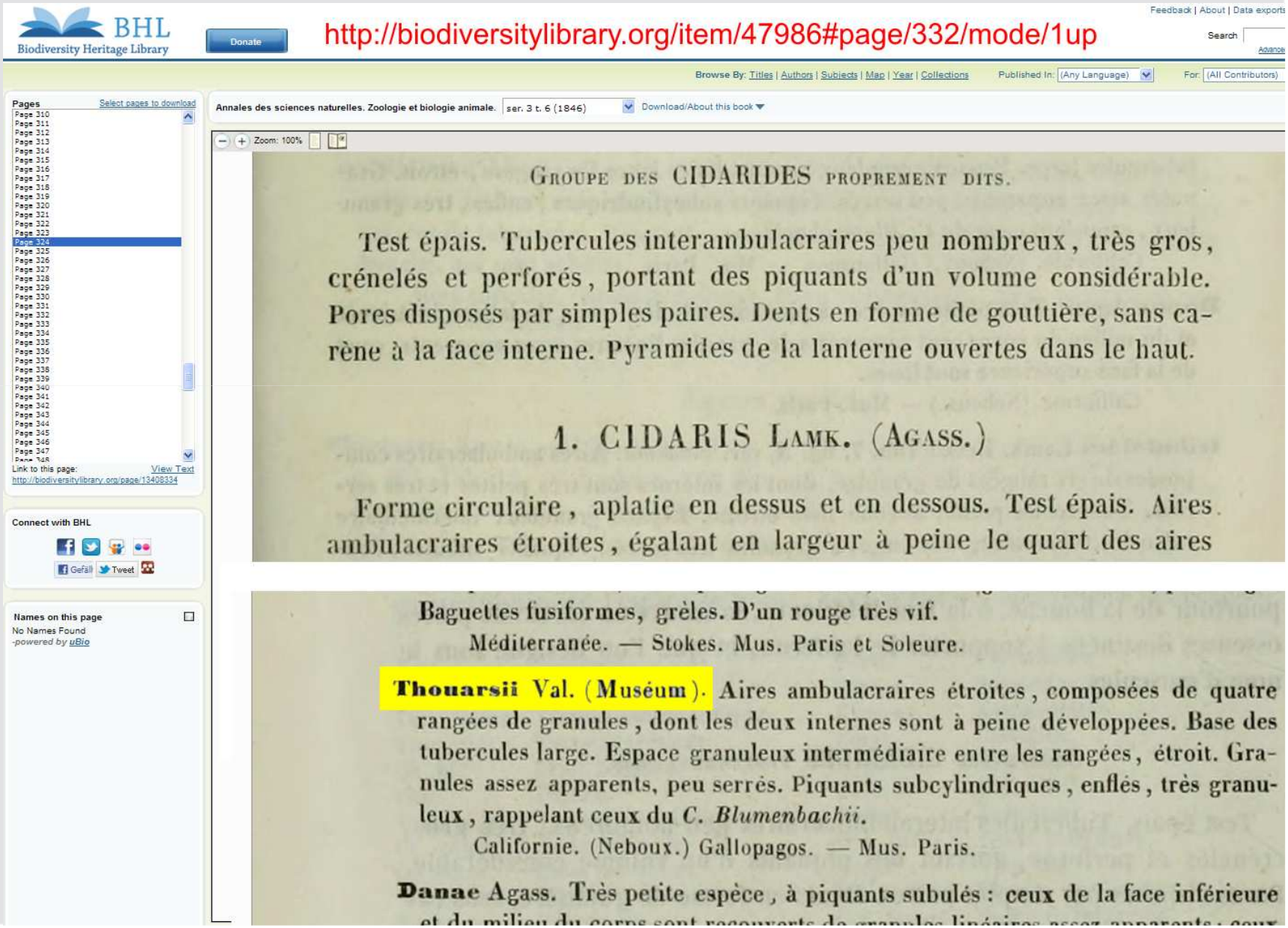
***Cidaris thouarsii* Valenciennes, 1846**
vs.
***Cidaris thouarsii* Valenciennes in L. Agassiz & Desor, 1846**
vs.
***Cidaris thouarsii* L. Agassiz & Desor, 1846**

The Code
50.1. Identity of authors. The author of a name or nomenclatural act is the person who first publishes it [Arts. 8, 11] in a way that satisfies the criteria of availability [Arts. 10 to 20] ... If a work is by more than one person but it is clear from the contents that only one of these is responsible for the name or act, then that person is the author; otherwise the author of the work is deemed to be the author of the name or act. ...



Agassiz, L. & Desor, P. J. E. 1846. Catalogue raisonné des familles, des genres, et des espèces de la classe des échinodermes. *Annales des Sciences Naturelles, Troisième Série, Zoologie 6, 305-374.*

Authority: “Meier in Müller, 1999”



GROUPE DES CIDARIDES PROPREMENT DITS.

Test épais. Tubercules interambulacraires peu nombreux, très gros, crénelés et perforés, portant des piquants d'un volume considérable. Pores disposés par simples paires. Dents en forme de gouttière, sans carène à la face interne. Pyramides de la lanterne ouvertes dans le haut.

1. CIDARIS LAMK. (AGASS.)

Forme circulaire, aplatie en dessus et en dessous. Test épais. Aires ambulacraires étroites, égalant en largeur à peine le quart des aires

Baguettes fusiformes, grêles. D'un rouge très vif.
Méditerranée. — Stokes. Mus. Paris et Soleure.

Thouarsii Val. (Muséum). Aires ambulacraires étroites, composées de quatre rangées de granules, dont les deux internes sont à peine développées. Base des tubercules large. Espace granuleux intermédiaire entre les rangées, étroit. Granules assez apparents, peu serrés. Piquants subcylindriques, enflés, très granuleux, rappelant ceux du *C. Blumenbachii*.
Californie. (Neboux.) Gallopagos. — Mus. Paris.

Danae Agass. Très petite espèce, à piquants subulés : ceux de la face inférieure

Authority: "Meier in Müller, 1999"

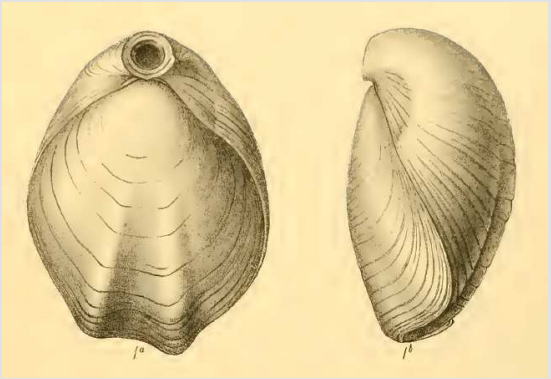
***Terebratula hoernesi* Suess, 1889**

vs.

***Terebratula hoernesi* Suess in Dreger, 1889**

vs.

***Terebratula hoernesi* Dreger, 1889**



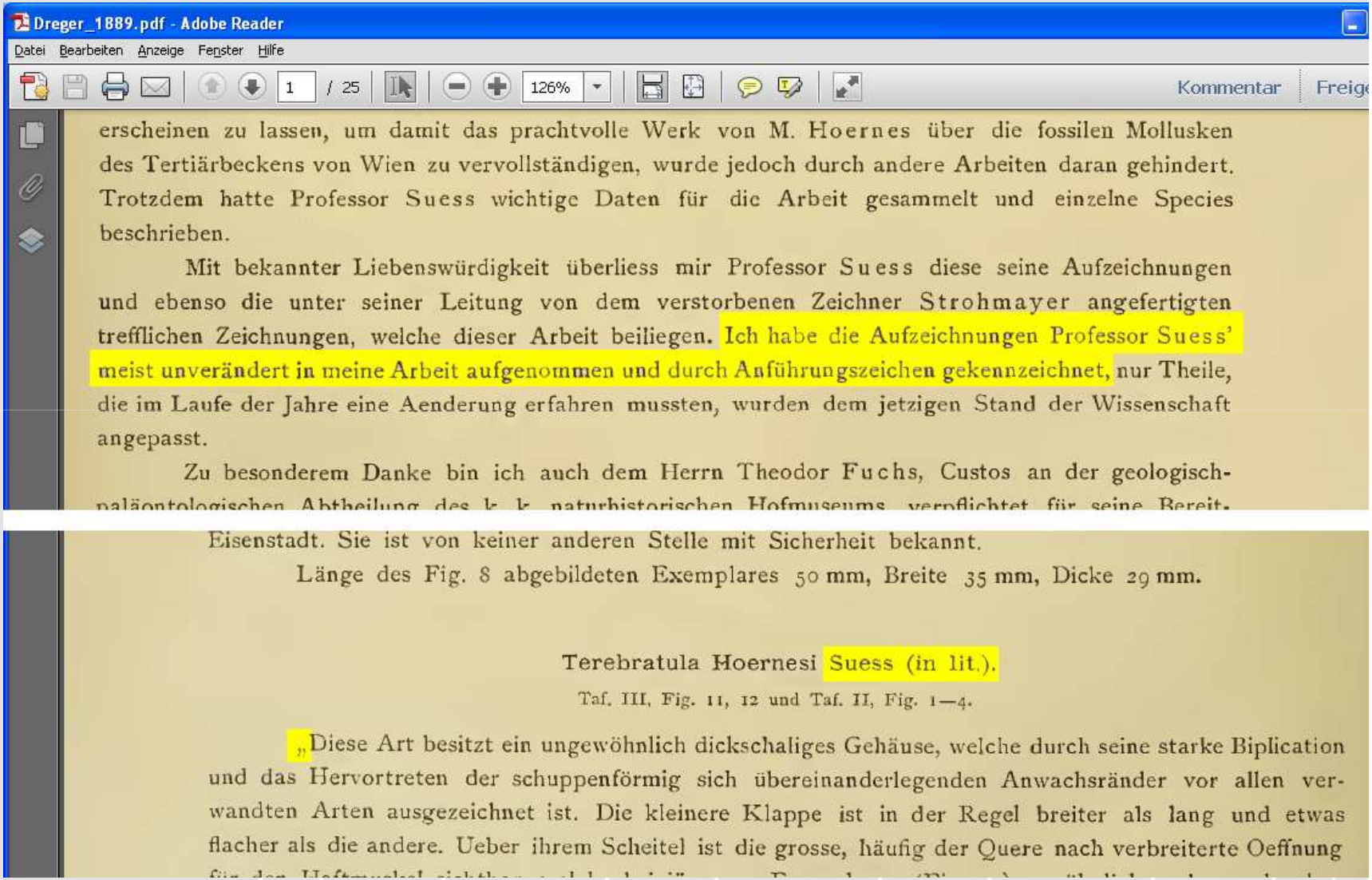
The Code

50.1.1. However, if it is clear from the contents that some person other than an author of the work is alone responsible both for the name or act and for satisfying the criteria of availability other than actual publication, then that other person is the author of the name or act. ...

Example. The binomen *Dasyurus laniarius* (Mammalia) was published in an account of expeditions of which Mitchell (1838) is the author. The specific name *laniarius* in this binomen and the description of the taxon are contained in a letter from Owen to Mitchell that the latter published verbatim (explicitly demonstrating in the work itself that Owen alone was responsible both for the name and for the description which made it available). Owen is the author of *D. laniarius*, not Mitchell.

Dreger, J. 1889. Die tertiären Brachiopoden des Wiener Beckens. *Beiträge zur Paläontologie und Geologie Österreich-Ungarns und des Orients 7, 179-192.*

Authority: "Meier in Müller, 1999"

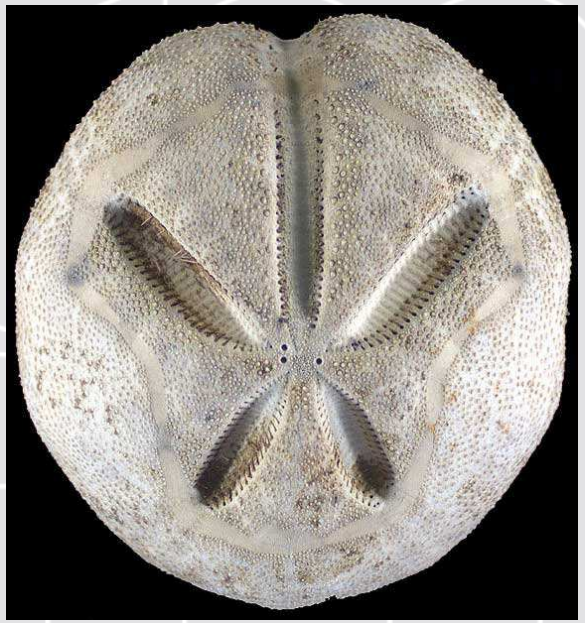


http://www.landesmuseum.at/pdf_frei_remote/BPalOeU_007_0179-0192.pdf

Authority in brackets?

Original combination (basionym):
***Spatangus* (*Tripylus*) *cavernosus* Philippi, 1845**

***Spatangus cavernosus* Philippi, 1845**
***Brissopsis cavernosus* (Philippi, 1845)**
***Faorina cavernosa* (Philippi, 1845)**
***Tripylus* (*Abatus*) *cavernosus* Philippi, 1845**
***Hemiaster cavernosus* (Philippi, 1845)**
***Tripylus cavernosus* Philippi, 1845**
***Abatus cavernosus* (Philippi, 1845)**



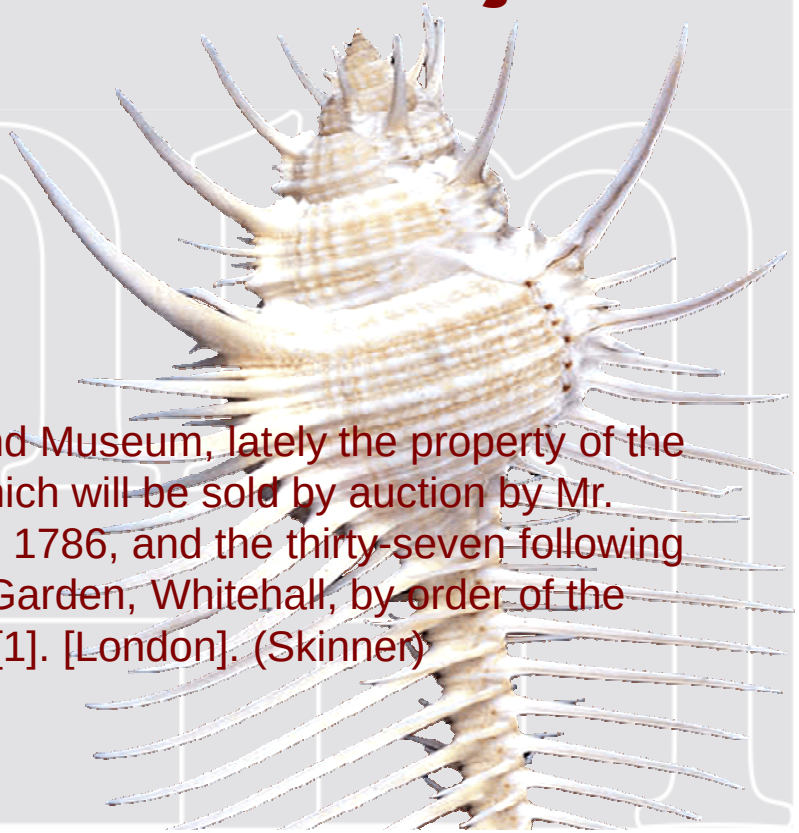
Names

In some publications the author responsible for new names and nomenclatural acts is not stated directly in the original source, but can sometimes be inferred from reliable external evidence. Recommendation 51D of the Code states: "...if the authorship is known or inferred from external evidence, the name of the author, if cited, should be enclosed in square brackets to show the original anonymity.

e.g.:

***Murex pecten* [Lightfoot], 1786**

[Lightfoot, J.] 1786. A catalogue of the Portland Museum, lately the property of the Duchess Dowager of Portland, deceased: Which will be sold by auction by Mr. Skinner and Co. On Monday the 24th of April, 1786, and the thirty-seven following days (...) at her late dwelling-house, in Privy-Garden, Whitehall, by order of the Acting Executrix. - pp. i-viii [= 1-8], 3-194, pl. [1]. [London]. (Skinner)



The type concept

The type concept

Names of organsms are stabilized by fesignating a "type", which forms the basis for the diagnosis of the respective taxon – a process called "typification".
For species names types are individuals, for genera: type-species and for families: type-genera.

German	English	Common abbreviation
Holotyp	holotype	H (HT)
Syntyp	syntype	S (ST)
Neotyp	neotype	N (NT)
Lectotyp	lectotype	L (LT)
Isotyp	isotype	IT
Paratyp	paratype	PT
Paralectotyp	paralectotype	PL
Typoid	type	T
Epityp	epitype	ET
Abbildungsoriginal	figured specimen	AO
Belegmaterial	reference specimen	BM

The type concept – species

To characterize a species a specimen is selected and designated as holotype.

Additional (supplementary) specimens may serve as paratypes (formerly cotypes) – they are non-namebearing. Alternatively several specimens together can serve as type series – which are then called "syntypes".

The Code

72.1. Use of the term "type" relating to specimens. The term "type" forms part of many compound terms used by taxonomists to distinguish between particular kinds of specimens, only some of which are name-bearing types. For the purposes of the Code, three categories of specimens are regulated, namely

72.1.1. type series: all the specimens on which the author established a nominal species-group taxon […]; in the absence of holotype designation, or the designation of syntypes, or the subsequent designation of a lectotype, all are syntypes and collectively they constitute the name-bearing type;

72.1.2. name-bearing types: specimens with a name-bearing function, whether fixed originally (holotype [Art. 73.1] or syntypes [Art. 73.2]) or fixed subsequently (lectotype [Art. 74] or neotype [Art. 75]);

72.1.3. other specimens: those without a name-bearing function (paratypes [Art. 72.4.5], paralectotypes [Arts. 73.2.2, 74.1.3];

The type concept – species

In Zoology only animals, their parts or preparations thereof may serve as types.

In case of fossils natural casts/moulds and pseudomorphoses are eligible.

In Botany, in contrast, illustrations may serve as types too!!

The Code

72.5. Eligibility as name-bearing types. Only the following are eligible to be a name-bearing type, or part of a name-bearing type, of a nominal species-group taxon:

72.5.1. an animal, or any part of an animal, or an example of the fossilized work of an animal, or of the work of an extant animal if the name based on it was established before 1931;

72.5.2. a colony of animals that exists in nature as a single entity, derived by asexual or vegetative multiplication from a single individual (e.g. a colony of cnidarians, such as corals), or part of such a colony;

72.5.3. in the case of fossils, a natural replacement, natural impression, natural mould, or natural cast of an animal or colony, or part of either;

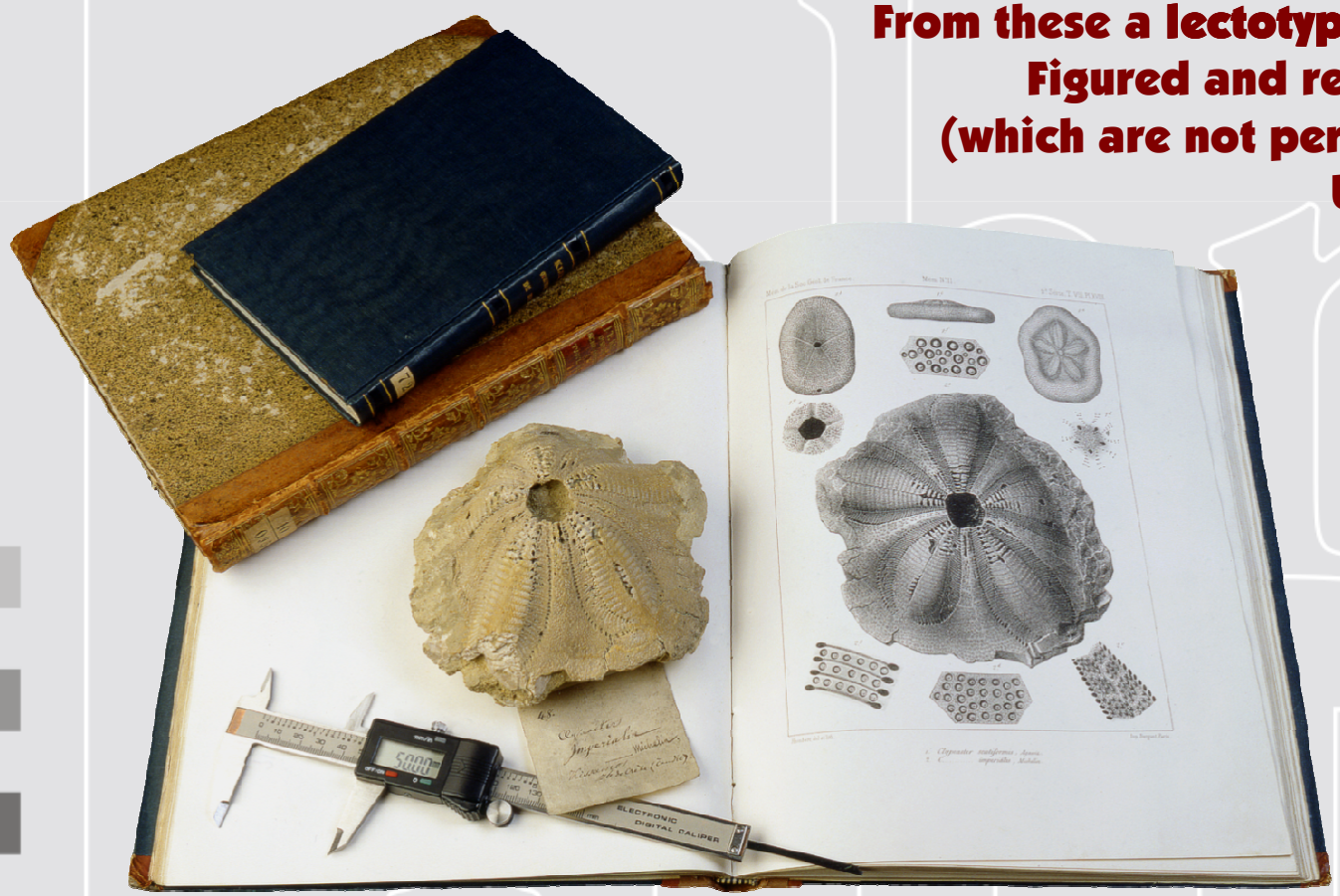
72.5.4. in extant species of protistans, one or more preparations of directly related individuals representing differing stages in the life cycle (a hapantotype) [Art. 73.3];

72.5.5. a preparation for microscope examination (e.g. a "type slide") containing one or more individual organisms, in which the name-bearing types are clearly indicated and identifiable.

The type concept – species

If no holotype was designated for a species described before 2000, then all the specimens on which the description is based are considered syntypes.

From these a lectotype may be selected. Figured and reference specimens (which are not per-se types) can thus become important.



The type concept – species

Holotype: designated by the original author (name-bearing!)
Paratype (cotype): supplementary specimens
Syntype: specimens of the type series

Lectotype: designated at a later point of time from one of the syntypes to clarify the usage of a name
Paralectotype: remaining syntypes

Neotype: if all primary types are lost it can be necessary to designate a new specimen as type to clarify the usage of a name. This new specimen must conform to the original description and derive from the same region and strata. (name-bearing!)

The type concept – species

Isotype: a duplicate of the holotype (Botany)

Epitype: is selected when the holotype, lectotype or neotyp of a valid taxon is demonstrably ambiguous (Botany)

Typotype: herbarium sheet, which served as basis for the illustration that acts as type (Botany)

The type concept – families

The type of a family is a genus – the type-genus.

All sub- or superordinate names (e. g. subfamily) within the family group have the same type-genus (Principle of Coordination).

The name of the family is derived from the genus name:
Felis **→ Felidae**
Schizoporella **→ Schizoporellidae**

Identical family names in different groups are to be avoided, therefore the whole genus name can be used as stem for the family name:

Miris **→ Miridae**
Mira **→ Miridae → Miraidae**
Mirum **→ Miridae → Mirumidae**

The type concept – genera

The type of a genus is a species (type-species).

by original designation: fixed in the original publication

by monotypy: only a single species was mentioned originally

by subsequent designation : the type-species was selected later. Only originally included species are eglible.

by absolute tautonomy: when the genus and species name are identical this is the type-species (e. g.: *Glis glis*)

by typification of replaced name: when a genus name needs to be replaced by a new name the type-species remains the same

by subsequent monotypy: if only a single species is attributed to the genus, but not mentioned in the original paper

Ranks

Baron

Viscount

Earl - Count

Marquess - Marquis

Duke

Prince of Wales

Ranks

Genera are combined in a family by putting the name of the type genus in plural and adding the suffix -idae.

So for example from the genus *Helix* the plural is Helices and so the family name is Helicidae.

Ranks

The International Code of Zoological Nomenclature regulates only names of the family, genus and species group. This is different for the botanical and Bacteria-Code.

Rank	Plants	Algae	Fungi	Animals	Bacteria
Division/Phylum	-phyta		-mycota		
Subdivision/Subphylum	-phytina		-mycotina		
Class	-opsida	-phyceae	-mycetes		-ia
Subclass	-idae	-phycidae	-mycetidae		-idae
Superorder	-anae				
Order	-ales				-ales
Suborder	-ineae				-ineae
Infraorder	-aria				
Superfamily	-acea			-oidea	
Epifamily				-oidae	
Family	-aceae			-idae	-aceae
Subfamily	-oideae			-inae	-oideae
Infrafamily					
Tribe	-eae			-ini	-eae
Subtribe	-inae			-ina	-inae

Ranks

As the knowledge on nature increased additional ranks became necessary. This was by adding prefixes. The ending of taxon names at specific ranks are in part regulated by the respective Code applicable (ICZN, ICBN, Bacterial Code, etc.)

Gigaorder
Magnorder or Megaorder
Grandorder or Capaxorder
Mirorder or Hyperorder
Order
Nanorder
Hypoorder
Minorder
Suborder
Infraorder
Parvorder or Microorder

Principle of Coordination

Familiy, Genus and Species-names are automatically established at all sub-ranks within the respecitve rank and thus have the same authorship at any of the sub-ranks.

→ **Superfamily Conoidea Fleming, 1822**
Familie Conidae Fleming, 1822
→ **Subfamily Coninae Fleming, 1822**
→ **Tribe Conini Fleming, 1822**
→ **Subtribe Conina Fleming, 1822**

The Code – Principle of Coordination
Article 36 [family-group] 43 [genus-group] 46 [species-group]
[…] A name established for a taxon at any rank […] is deemed to have been simultaneously established for nominal taxa at all other ranks in the family/genus/species-group; all these taxa have the same type […] The name has the same authorship and date at every rank.

Example. The family name HESPERIIDAE (Lepidoptera), based on *Hesperia* Fabricius, 1793, was established in 1809 by Latreille (as Hesperides). Latreille is deemed also to have simultaneously established the coordinate superfamily name HESPERIOIDEA and the coordinate subfamily name HESPERIINAE (even though the former was first used by Comstock & Comstock (1904) and the latter by Watson (1893)). The authorship and date of all three names is Latreille, 1809.

Synonyms

Principle of Priority
in which the oldest available name is applied in preference to newer names.

In zoological nomenclature, synonyms are different scientific names of the same rank that pertain to the same taxon,

= two names for the same species.

The earliest such name is called the senior synonym, while the later name is the junior synonym.

The earliest correctly published (and thus available) name, the senior synonym, takes precedence and must be used for the taxon,

Synonyms & Homonyms

Synonyms

e.g.: genus

Zuzalpheus **Ríos and Duffy, 2007**
is a junior synonym of

Synalpheus **Bate, 1888**
(Decapoda: Alpheidae)

Synonyms

e.g.: species

Pecten jacobaeus **(Linnaeus, 1758)**
basionym: ***Ostrea jacobaea*** **Linnaeus, 1758**

Pecten intermedius **Monterosato, 1899**
is a junior synonym

Synonyms

Objective synonyms refer to taxa with the same type and same rank.

This may be species-group taxa with the same type specimen or genus-group taxa with the same type species.

Synonyms

Objective synonyms

genus-group taxa of the same rank with the same type species.

e.g.:

Genus *Pseudobellardia* Cox, 1931
Type species: *Muricites auriculatus* Schlotheim, 1820. Eocene, Italy.

***Genus Gantmelanatria* Kowalke, 2001**
Type species: *Muricites auriculatus* Schlotheim, 1820. Eocene, Italy.

Synonyms

Subjective Synonyms

there is no such shared type, so the synonymy is open to judgment.

one researcher might consider the two types to refer to one and the same taxon, another might consider them to belong to different taxa.

e.g.: John Edward Gray published the name *Antilocapra anteflexa* in 1855 for a species of pronghorn, based on a pair of horns.

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

Homonyms

Within the same kingdom one generic name can apply to only one genus. This explains why the platypus genus is named *Ornithorhynchus* – George Shaw named it *Platypus* in 1799, but the name *Platypus* had already been given to a group of ambrosia beetles by Johann Friedrich Wilhelm Herbst in 1793.

Names with the same form but applying to different taxa are called homonyms. Since beetles and platypuses are both members of the kingdom Animalia, the name *Platypus* could not be used for both.

Johann Friedrich Blumenbach published the replacement name *Ornithorhynchus* in 1800.

Homonyms

Exechestoma **was introduced by Cossmann (1889) as new section with the Eocene *Cerithium angulosum* Lamarck, 1804 as type species.**

The taxon name *Exechestoma*, however, was already preoccupied by Brandt (1837) for a subgenus of the Medusozoa genus *Aequorea*.

Homonyms – genus level

Cuvier proposed the genus *Echidna* in 1797 for the spiny anteater.
However, Forster had already published the name *Echidna* in 1777 for a genus of moray eels.

Forster's use thus has priority, with Cuvier's being a junior homonym.
Illiger published the replacement name *Tachyglossus* in 1811.

Homonyms – genus level

A genus in one kingdom is allowed to bear a scientific name that is in use as a generic name in a kingdom that is governed by a different nomenclature code.

There are some five thousand such names in use in more than one kingdom.

***Ficus* = marine snail and fig-tree**

Homonyms – genus level

Aotus

golden pea and night monkey

Homonyms – genus level

Oenanthe

wheatears (Steinschmätzer) and water dropworts (Wasserfenchel)

Homonyms – genus level

Prunella

accentors (Braunelle, Sperlingsvogel) and self-heal (Brunelle, Lippenblütler)

Homonyms – species level

There are two major types of homonyms,

a) primary *objective homonyms* and

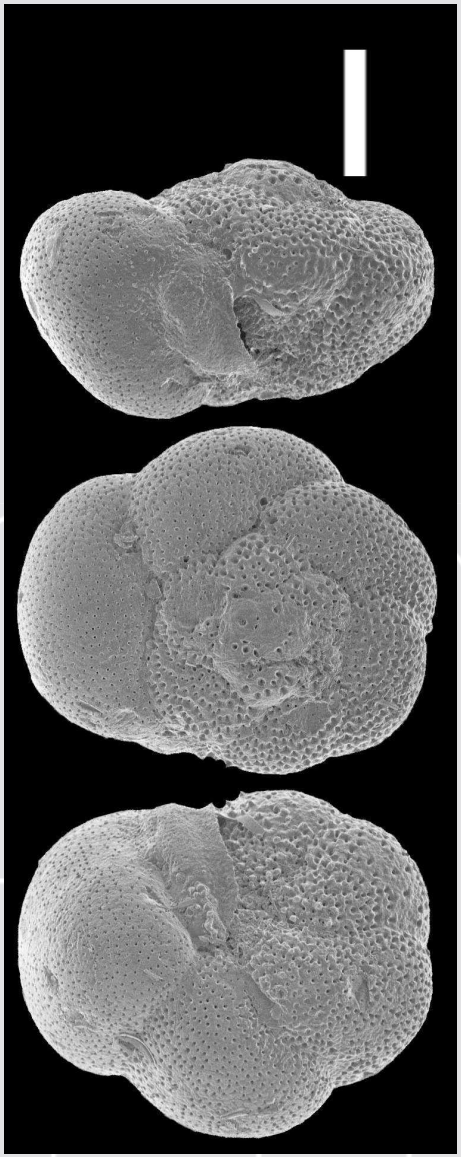
b) secondary *subjective homonyms*

Homonyms – species level

a) primary ***objective homonyms*** an example:

Globorotalia californica Smith, 1957 is a junior homonym of
Globorotalia californica Cushman & Todd, 1948

even if the latter is subjectively changed to ***Praeglobotruncana californica*** (Cushman & Todd)
the name of the junior homonym is born dead (= "stillborn" in ICZN)

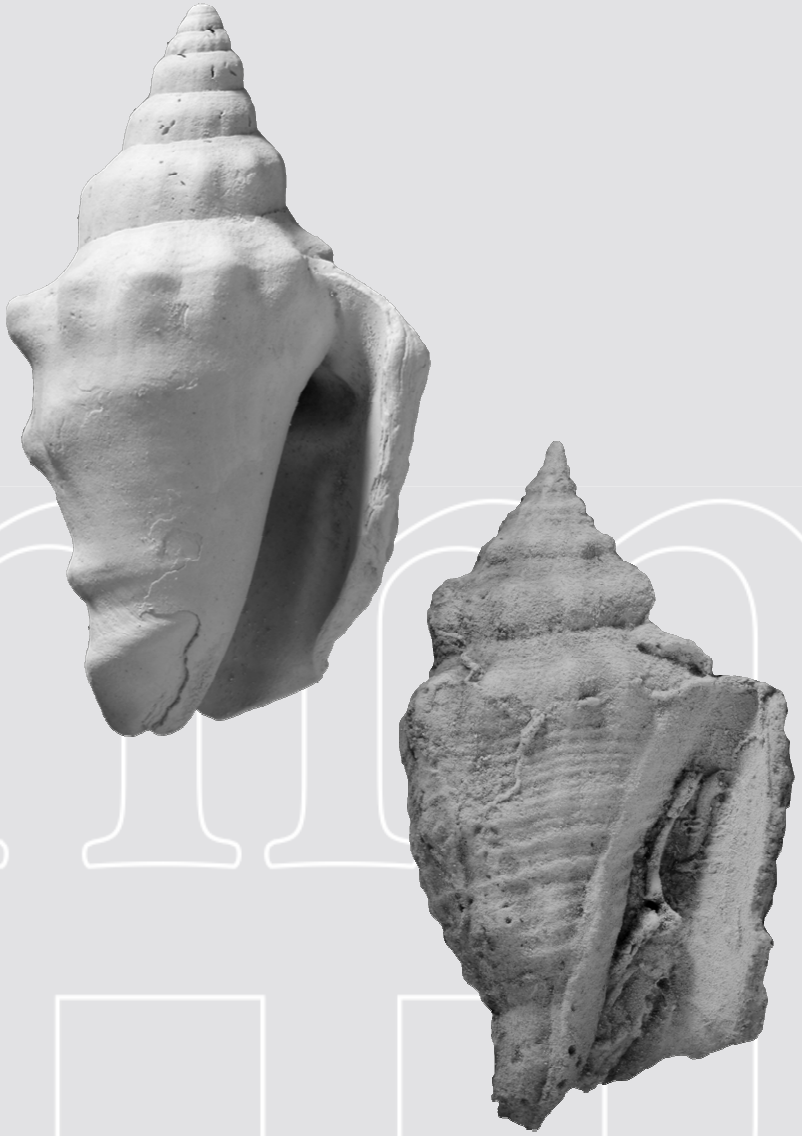


Homonyms – species level

a) primary ***objective homonyms*** an example:

Strombus nodosus Borson, 1821
Miocene, Italy

Strombus nodosus Sowerby, 1840
Miocene, India



Homonyms – species level

b) secondary *subjective homonyms*

is always a result of a revision and concerns the subjective reassessment of the genus so producing a new combination of names.

taxa are separate species, but by chance, had the same specific name resulting in homonymy when their generic names are synonymized

Homonyms – species level

b) secondary *subjective homonyms*

example:

***Nassa* (*Telasco*) *dispar* Adams, 1852**
extant IWP species
[is junior synonym of *Nassarius luridus* (Gould, 1850)]
revised by Cernohorsky W. O. (1984) and placed in *Nassarius*

Homonyms – species level

b) secondary *subjective homonyms*

example:

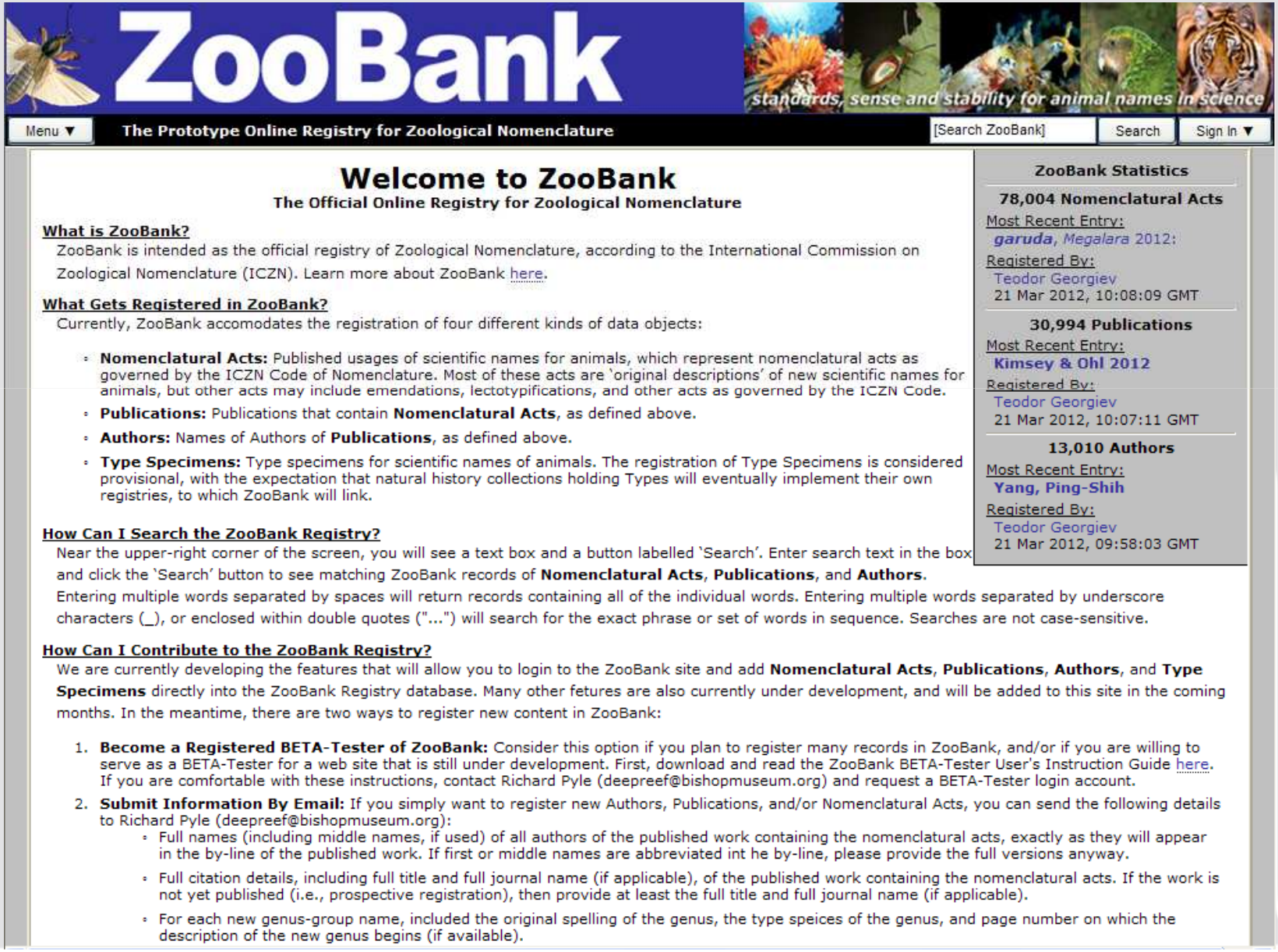
***Nassa* (*Telasco*) *dispar* Adams, 1852**

***Nassa* (*Niotha*) *dispar* Boettger, 1902**
Miocene, Romania
revised by Harzhauser & Kowalke (2004) and placed in *Nassarius*

= *Nassarius dispar* (Boettger, 1902) is a secondary subjective homonym of *Nassarius dispar* (Adams, 1852)

replacement name:
***Nassarius fritzsteiningeri* Harzhauser & Cernohorsky, 2011**

Mandatory registration of names?



Mandatory registration of names?

Intended as the official registry of Zoological Nomenclature (approved by the ICZN).

Launched exactly 250 years after the very day that the ICZN Code fixes the official start of scientific zoological nomenclature (1/1/1758).

Open-Access Database for registration of nomenclatural acts, publications, taxon authors and type-specimens

Nomen dubium

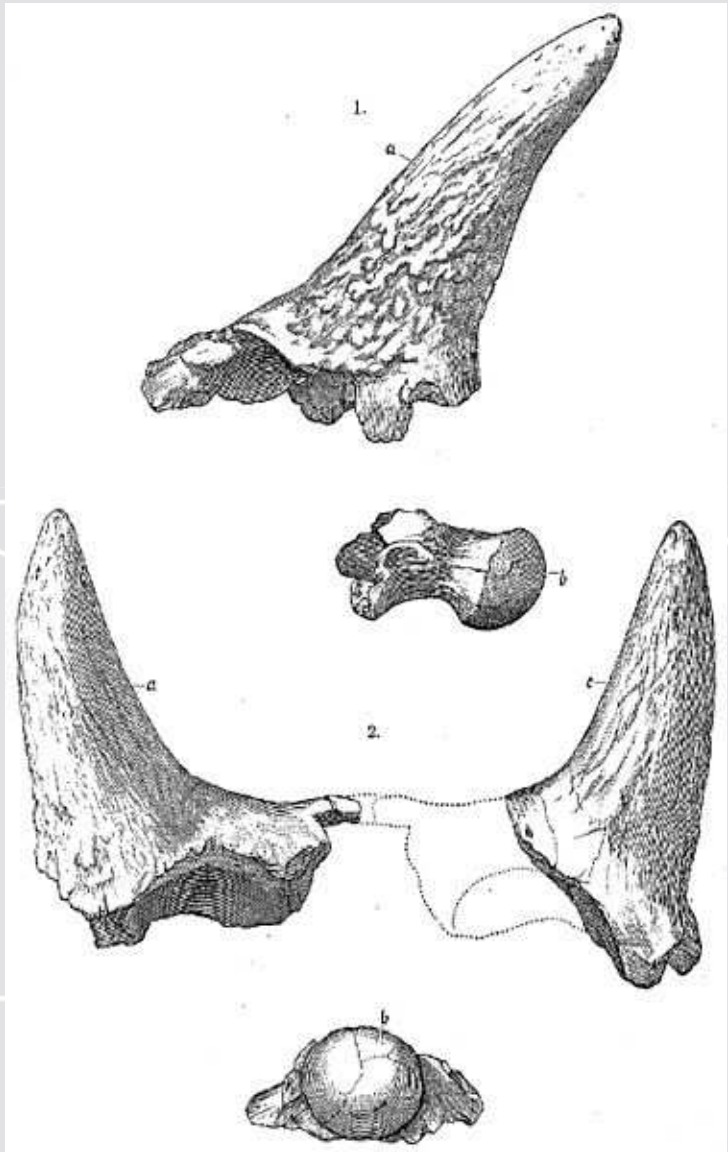
A nomen dubium (Latin, "doubtful name") is a taxon that has not been characterised in enough detail and whose type material is not sufficient for it to be identified.

A nomen dubium is still available for consideration in terms of synonymy and/or homonymy, and if a name previously regarded as a nomen dubium is able to be identified with a better distinguished taxon that was named later, the nomen dubium is still the senior synonym, and hence the correct name for the taxon.

Nomen dubium

Ceratops **is a dubious genus of ceratopsian dinosaur which lived during the Late Cretaceous. Its fossils have been found in Montana.**

Although poorly known, *Ceratops* is important in the history of dinosaurs, since it is the type species for which both Ceratopsia and Ceratopsidae are named.



type specimen of *Ceratops montanus* Marsh, 1888

Nomen dubium

Is Judith a

Ceratops montanus?

Nomen novum

nom. nov.
NOMEN NOVUM. lat. = neuer Name.
Ein neuer Name von einer Art, Gattung, usw. eines Taxons, wird gebildet, wenn ein älterer Name auf Grund bestimmter Umstände, z.B. Homonymie, ungültig geworden ist. Der Typus muß aber beibehalten werden. Statt „nom. nov." findet man auch die Abkürzung „n. name" (new name, engl. = neuer Name).

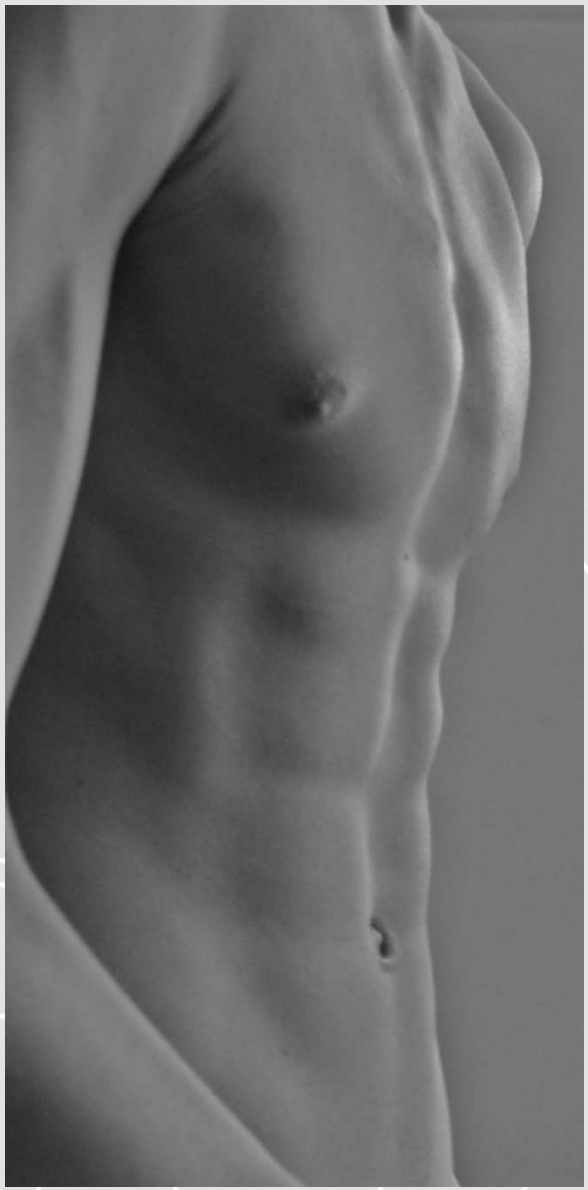
nom. mut.
NOMEN MUTANDUM, lat. = zu veränderder Name.
***Solen plagiaulax* Cossmann, 1886**
1844 *Solen obliquus* Sowerby, S. 15, Taf. 5 / 4 [non Spenglert, 1794]
1886 *Solen plagiaulax* Cossmann, S. 102 [NOM. MUT. Pro *Solen obliquus* Sowerby]. Cossmann, 1886 änderte den Artnamen *obliquus* in *plagiaulax* um, da es den Artnamen *Solen obliquus* Spengler, 1794 schon gibt.

Nomen nudum

A nomen nudum (Latin, bare name) is a name that fails to meet the requirements for being validly published under the appropriate code of nomenclature (for instance, no published description).

A nomen nudum has no official nomenclatorial standing, and does not compete for synonymy, homonymy, etc.

Should a name that was previously a nomen nudum ever be validly published, its priority dates from valid publication, not from original appearance.



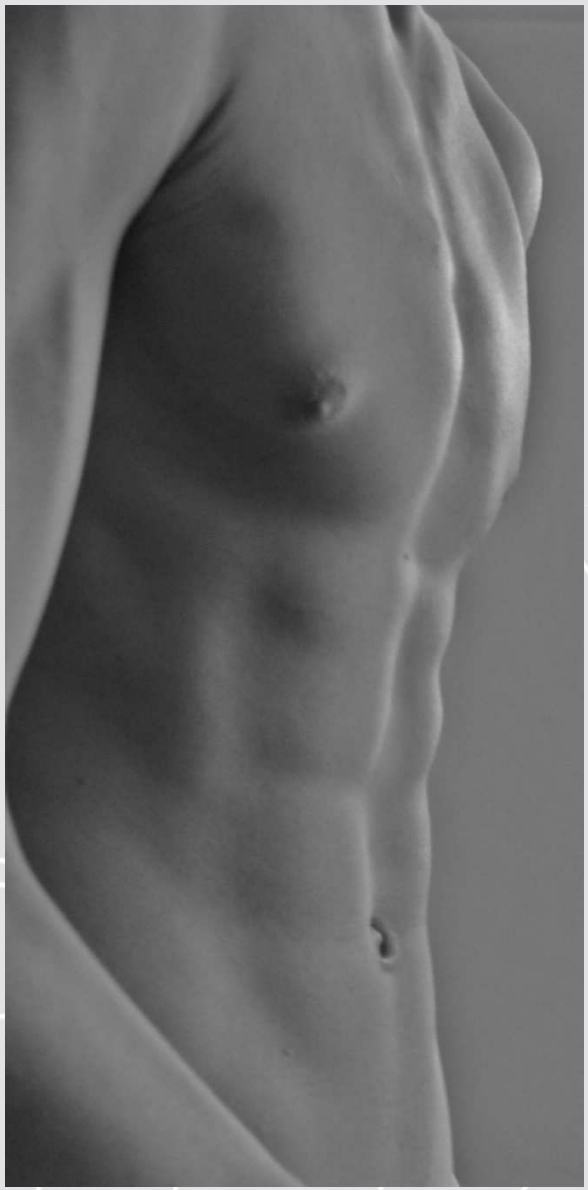
Nomen nudum

typically:

in historical lists without any descriptions

in abstracts
(be careful with congress abstracts)

in online-first papers
(name is available with date of print)



Nomina

nom. ambig.
NOMEN AMBIGUUM, lat. = mehrdeutiger Name (einer Art, Gattung, usw.).
Hier handelt es sich um einen Namen, der in einem unterschiedlichen Sinn angewendet wird, z.B. bei einem Artnamen, der irrtümlich zwei verschiedene Arten zusammenfasst.

nom. conf.
NOMEN CONFUSUM, lat. = verworrener Name.
***Malleomyces* Hallier, 1870 [nom. confusum]**
Wenn z.B. bei den Bakterien ein Name auf einer Mischkultur beruht, spricht man von einem „nomen confusum".

Nomina

nom. cons., nom. conserv.
NOMEN CONSERVANDUM, lat. = zu konservierender Name.

Damit die Namen bestimmter taxonomischer Einheiten nicht verändert werden und sie als zweckmäßige Ausnahmen erhalten bleiben, werden von d e n Internationalen Kommissionen für Nomenklatur Listen mit Namen veröffentlicht, die als Ausnahmen erhalten werden sollen. Solche Listen können laufend ergänzt werden. Ausnahmen entstehen dann, wenn z.B. ein Gattungsname beibehalten werden soll, aber der ursprüngliche Typus ausgeschlossen wird. Hiermit will man Veränderungen in der Nomenklatur von Gattungen, Familien und dazwischenliegender Taxa vermeiden. Diese Namen werden mit „nom. cons." gekennzeichnet.
Da aber jeder Name einen Typus benötigt, um gültig zu sein, wird nun für ihn ein neuer passender Typus ausgewählt, der „Typus conservandus" (lat. = konservierender, erhaltender Typus; abgekürzt „typ. cons.").

Nomina

nom. dub.
NOMEN DUBIUM, lat. = zweifelhafter Name.

1931 *Polypodiisporites favus* Potonie, S. 556, Abb. 3 [NOM. DUB.].
In einer Veröffentlichung wird der N a m e einer neuen Art genannt; sie wird kaum beschrieben und schlecht abgebildet. Auch die Differentialdiagnose definiert keine genaue Abgrenzung gegenüber den bis dahin bekannten Nachbarformen. Dieser Name ist somit schlecht definiert, bleibt aber verfügbar und darf also nicht erneut vergeben werden. In diesem Fall müßte der revidierende Autor sich das Originalmaterial (wenn dieses nicht mehr existiert, dann Material von der Typlokalität) beschaffen, untersuchen und die Diagnose vervollständigen.

Nomina

nom. vernac.
NOMEN VERNACULUM, lat. = einheimischer Name, Name der Umgangssprache.
1856 Platysoleniten Pander, S. 84 , Abb. 17 [NOM. VERNAC.].
Ein „nomen vernaculum" ist ein Name, der nicht in die lateinische Sprache übertragen wurde und somit nicht verfügbar ist.

nom. vet.
NOMEN VETITUM, lat. = verbotener, nicht erlaubter Name.
***Alphacyrtiopsis* Gatinaud, 1949 , S. 490 (NOM. VET.).**
Ein „nomen vetitum" ist ein Gattungsname, der durch den entsprechenden „Code" nicht gebilligt wurde, oder für den, wenn die Erstveröffentlichung nach 1930 erfolgte, keine deutlich definierte Typusart genannt wurde.

Nomen oblitum

A nomen oblitum is a "forgotten name"

After 1 January 2000, a scientific name may be formally declared to be a nomen oblitum when it has not been used as a valid name within the scientific community since 1899

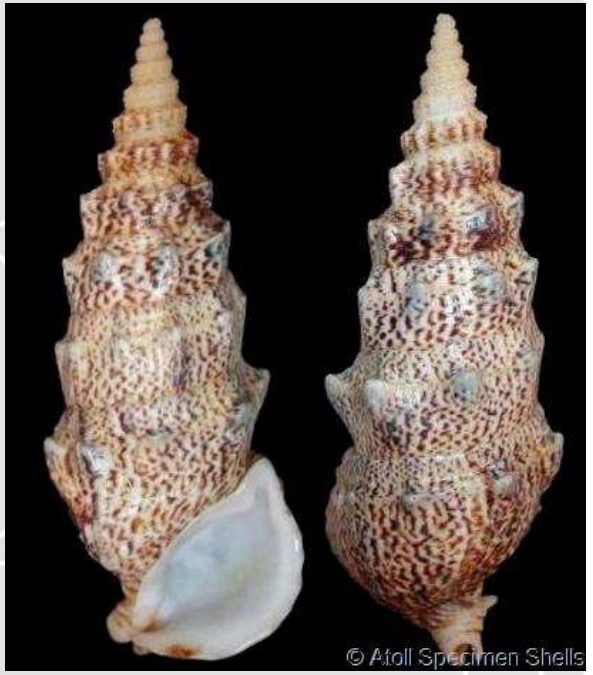
and when it is either a senior synonym or a homonym

Once it has formally been declared to be a nomen oblitum, the disused name is to be 'forgotten'. By the same act, the junior name must be declared to be a nomen protectum; from then on, it takes precedence.

Nomen oblitum

Röding (1798) introduced
Strombus coronatus for a cerithiid gastropod.

It was soon recognized that
Strombus coronatus Röding, 1798
is a junior synonynm of
Murex aluco Linnaeus,1758
= ***Pseudovertagus aluco*** (Linnaeus, 1758



Consequently, Röding's ***coronatus*** soon
disappeared from the literature,
and no 20th century reference to this taxon
has been published.

Nomen oblitum

Therefore, Strombus *coronatus* Röding may be treated as *nomen oblitum*.

But…

Defrance (1827) introduced the primary homonym *Strombus coronatus*, 29 yr after Röding. He provided an adequate description of the shell and compared its morphology briefly with the extant *Strombus gigas* Linnaeus, 1758.

This taxon is widely known and accepted and should be treated as *nomen protectum*…

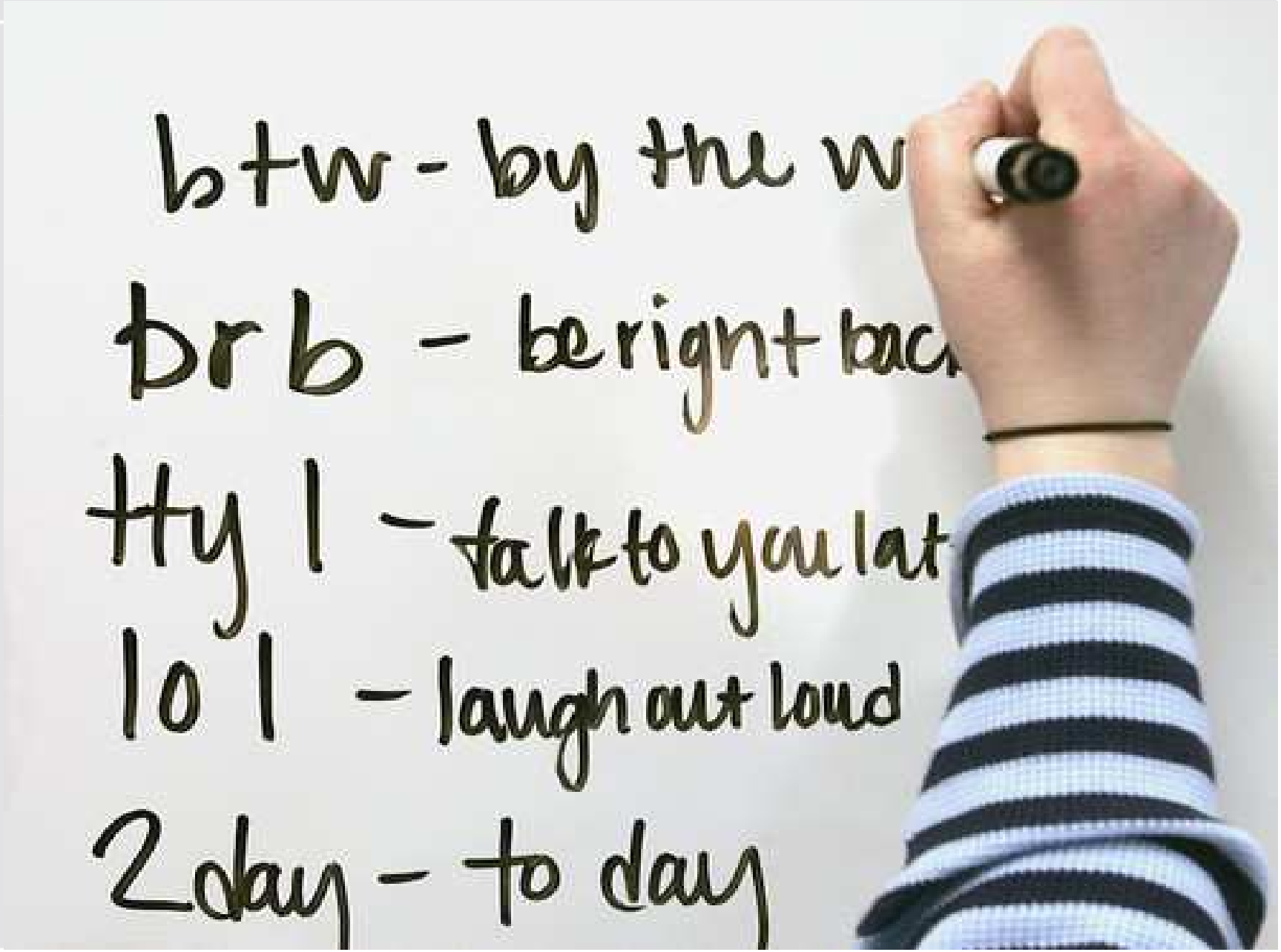
Nomen oblitum

nomen protectum…?

ICZN Article 23.2 pleas for nomenclatural stability and perpetuation of long-accepted names.
The name *Strombus coronatus* Röding, 1798 has not been used as a valid name after 1899. ("the senior homonym has not been used as a valid name after 1899").

ICZN Article 23.9.1.2.: "the junior homonym has been used as its presumed valid name in at least 25 works, published by at least 10 authors in the immediately preceding 50 yr and encompassing a span of not less than 10 yr."

Abbreviations



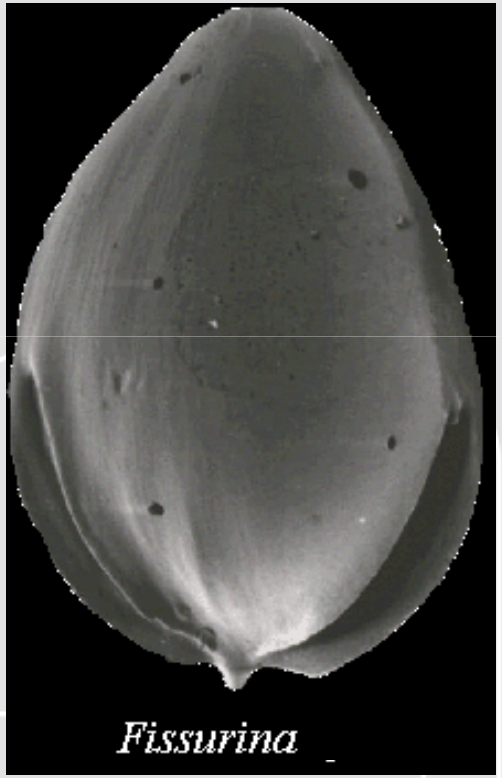
Abbreviations

aff.

affinis, lat. = ähnlich.

Fissurina* aff. *F. earlandi
„aff." bedeutet, dass die vorliegende Art ähnlich der von *F. earlandi* ist, aber in einigen Merkmalen von ihr deutlich abweicht. Noch deutlicher ist die folgende Ausdrucksweise: *Fissurina* n.sp., aff. *F. earlandi*.

Die Unsicherheit der Zuordnung, die durch „aff." ausgedrückt wird, ist größer, als wenn man die Abkürzung „cf." anwendet.



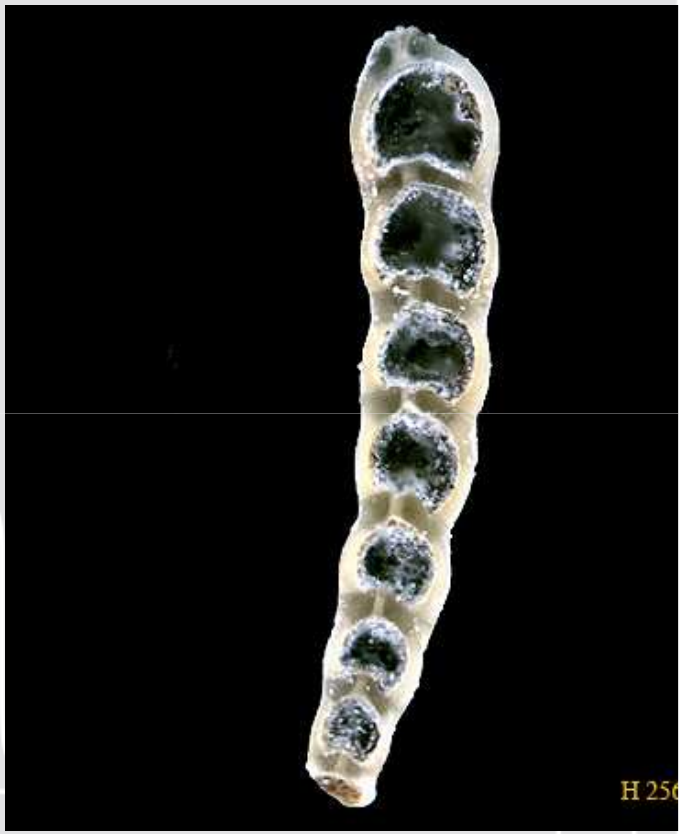
Granzow, W. 2000. Abkürzungen und Symbole in der biologischen Nomenklatur. Senckenbergiana Lethaea 80, 350-37.

Abbreviations

auct., autorum – auctores

***Nodosaria elongata* autorum**

Der Zusatz „autorum" drückt aus, dass man unter der Art *Nodosaria elongata* eine Sammelgruppe versteht, in der mehrere Arten vermutet werden, das vorliegende Material aber für eine sichere Bestimmung nicht ausreicht.



Abbreviations

cf., cfr., conf.

confer, lat. = vergleiche! im erweiterten Sinn verwendet als „etwa, zu vergleichen mit, ähnlich mit"

***Cicatricosisporites* cf. *crassistriatus* Burger, 1966. Die Abkürzung bedeutet, dass die vorliegende Form in die Gattung *Cicatricosisporites* gehört, und es sich wahrscheinlich um die Art *crassistriatus* handelt. Die Unsicherheit der Zuordnung bei „cf." ist schwächer, als wenn man die Abkürzung „aff." verwendet. Die Abkürzung „cfr." darf man nicht verwechseln mit der getrennt geschriebenen Abkürzung „c. fr. = cum fructibus, lat. = mit Früchten".**

Abbreviations

cum syn.

cum synonymis, lat. = mit Synonymen.

1896 *Thecidium mediterraneum* Risso. - Oppenheim, S. 43 [cum syn.].

Der Autor dieses Zitats aus einer Synonymieliste gibt mit der Abkürzung „cum syn." zu verstehen, dass er die Synonymieliste von Oppenheim, 1896, so wie sie dort aufgeführt ist, übernimmt.

Abbreviations

emend.

emendatus, lat. = korrekt, fehlerfrei; emendavit, lat. = er/sie hat verbessert; emendator, lat. = Verbesserer.

Bedeutung in der Botanik und Bakteriologie: Änderung oder Ergänzung der Gattungs- oder Artmerkmale.

***Abiespollenites* Thiergart, 1937 emend. Potonie, 1958**

THIERGART hat 1937 die Gattung *Abiespollenites* aufgestellt. Die taxonomische Umschreibung Diagnose wurde aber von Potonie, 1958 neu gefasst. Letzterer hat die Gattung somit emendiert.

Abbreviations

emend.

emendatus, lat. = korrekt, fehlerfrei; emendavit, lat. = er/sie hat

Eine Emendation im Sinn der zoologischen Nomenklatur ist eine Berichtigung einer ursprünglich inkorrekten Schreibweise. Der emendierte Name (Familie, Gattung, Art, usw.) behält Autor und Jahreszahl der - ehemals inkorrekten - Originalschreibweise bei.

Abbreviations

et al.

et alii, lat. = und andere.

Greuter et al., 1988: hiermit ist gemeint, dass neben Greuter noch weitere Autoren an der Veröffentlichung beteiligt waren, die der Kürze wegen aber nicht aufgeführt werden.

Abbreviations

fide, f.

FIDE, lat. = im Vertrauen.
1803 *Vermiculum laeve* Montagu, S. 524 [fide Bartenstein & Brand].
1937 *Lagena laevis* (Montagu) Bartenstein & Brand, 1937

Dem Autor dieser Synonymieliste lag die Veröffentlichung von Montagu, 1803 nicht vor. Er vertraute auf die Angaben von Bartenstein & Brand, 1937, deren Publikation er kannte.

Abbreviations

gen. nov., gen. n., n. gen., g.n., n.g.
GENUS NOVUM, lat. = neue Gattung.

***Contignisporites* gen. nov. Hiermit hat Dettmann, 1963 eine neue Gattung aufgestellt. Diese neue Gattung muß nun von späteren Autoren folgendermaßen zitiert werden: *Contignisporites* Dettmann, 1963.**

Abbreviations

ib., ibid.
IBIDEM, lat. = am selben Ort.

in
***Foveogleicheniidites* Burger in Norvick & Burger, 1975 In der Publikation von Norvick & Burger, 1975 hat nur der Koautor Burger diese neue Gattung aufgestellt.**

Arch. Molluskenkunde | **140** | (2) | 201–237 | 2 figs, 7 pls | Frankfurt am Main, 30.12.2011

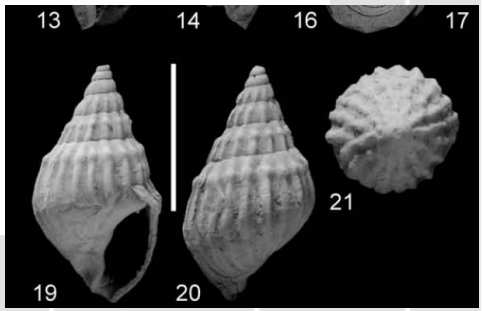
Melanopsis lucanensis NEUBAUER n. sp.
Pl. 1, Figs. 10–12

Material: 9 specimens from samples 43, 44.

Holotype: NHMW Inv. 2010/0042/0001, height: 13 mm, diameter: 5 mm, spire angle: 35°; illustrated on pl. 1, figs. 10–12. — Paratype 1: NHMW Inv. 2010/0042/0002, height: 28 mm, diameter: 13 mm, spire angle: 35°; from sample 43 (68.5 m); Paratype 2: NHMW Inv. 2010/0042/0035, height: 10 mm, diameter: 4 mm, spire angle: 30°; from type stratum; Paratype 3: NHMW Inv. 2010/0042/0036, height: 16 mm, diameter: 6 mm, spire angle: 35°; from sample 43 (68.5 m)

Middle Miocene freshwater mollusks from Lake Sinj (Dinaride Lake System, SE Croatia; Langhian)

THOMAS A. NEUBAUER[1], OLEG MANDIC[2] & MATHIAS HARZHAUSER[3]



Abbreviations

in sched.

in SCHEDULA, lat. = auf dem Blättchen Papier, in der Schublade
in SCHEDA, lat. = auf dem Etikett.

***Nonion beisseli* Hiltermann & Koch in sched.**
Ein Name, der z.B. aus einer Sammlung stammt. Damit ist der Name aber nicht gültig veröffentlicht.

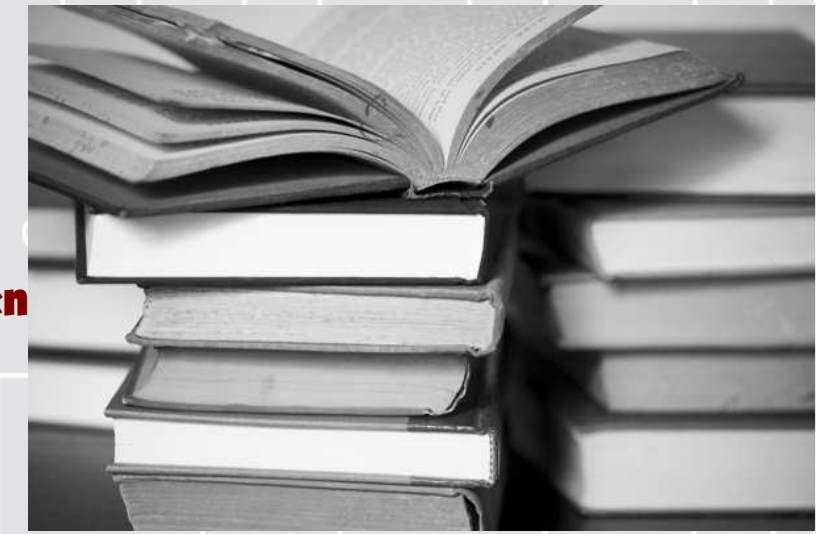
Abbreviations

l.c., loc. cit.
loco citato, lat. = an der zitierten Stelle.
1888 *Ichthoydectes* Woodward, Proc. Geol. Assoc, vol. 10, S. 311.
1888 *Cladocyclas* Woodward, l.c., S. 325.

Die Abkürzung verwendet man, um auf ein Literaturzitat zu verweisen, das vorher schon erwähnt wurde. Die Verwendung dieses Kürzels beschränkt sich nicht nur auf Synonymielisten, sondern kann auch in einem normalen Text verwendet werden.

op. cit.
opere citato, lat. =
aufgerufenes wissenschaftliches Werk.

Um eine Wiederholung der oben angeführten Jahreszahl und der Seitenzahlen zu vermeiden, wird statt dessen die Abkürzung „op. cit" verwendet.



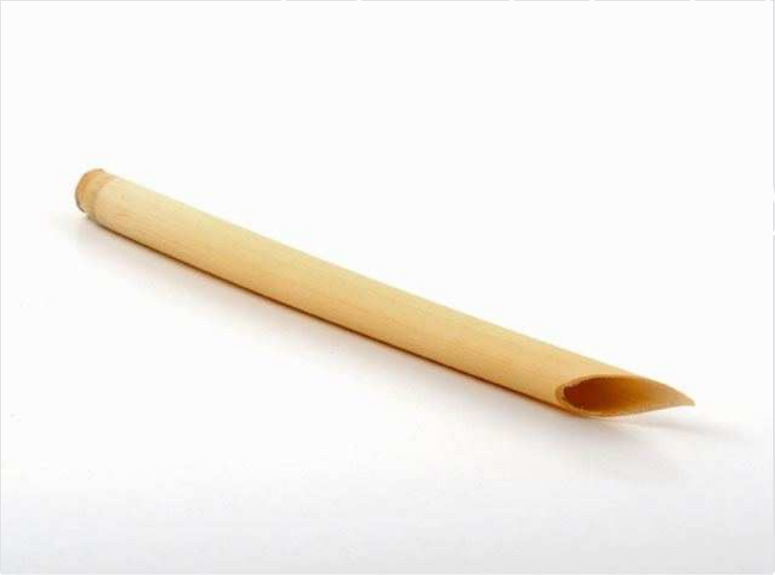
Abbreviations

Lapsus calami
lapsus calami, lat. = Fehler des Schreibrohrs.

Familie Tabulacyathidae Vologdin, 1956, S. 878

Hill, 1972: Tabulathyathidae Vologdin, 1956 nom. correct. et lapsus calami pro Tabulocyathidae Vologdin, 1956, S. 878.

Unter einem "lapsus calami" versteht man einen Schreibfehler - hier bei Vologdin, 1956 - in der ursprünglichen Schreibweise eines Namens.



Abbreviations

m., mihi
mihi, lat. = von mir.
nob., nobis
NOBIS, lat. = uns, dh. von uns.

1854 *Lingulina tenera* m. - Bornemann, S. 3 8 , Taf. 3 / 2 4. "m." weist hier Bornemann als den Erstautor dieser Art aus. Die Abkürzung ist heute nicht mehr gebräuchlich.

Cérite antique. *Cerithium antiquum.* Nob.

Fig. 3. Vu de face en dessous.
Fig. 4. Le même, en dessus.
Fig. 5. Var. *a.* Nob. Du côté de l'ouverture.
Fig. 6. L'ouverture de profil.

Cérite d'Héricart. *Cerithium Hericarti* Nob.

Fig. 7. Du côté de l'ouverture.
Fig. 8. Du côté du dos.
Fig. 9. Un tour très-grossi.

Cérite a grandelèvre. *Cerithium*

Fig. 10. Du côté de l'ouvertur
Fig. 11. Du côté du dos.
Fig. 12. L'ouverture vue de p

Cérite de Graves. *Cerithium*

Fig. 13. Vu en dessous.
Fig. 14. Vu en dessus.
Fig. 15. L'ouverture de profil

3. Nodosaria, *Lam.* Testa recta, vel leviter arcuata, elongata, conica, nodosa, nodulis vel laevigatis, vel longitudinaliter striatis; loculi complures, tumidiusculi, septa transversa sub centro perforata.

1. N. *radicula*, *Enc.* t. 465. f. 4. a, b, c, testa recta, oblongo-attenuata, articulis globosis laevibus, apertura sublaterali. Hab. mare adriaticum.

† 2. N. *tenella*, m., *Tab. II. fig. 4.*, testa elongato-subulata, recta, longitudinaliter subtiliterque striata, tenui. Hab. arenam Shukowcensem et Saliscensem Volhyniae. Apertura ultimi loculi plurimum fracti major.

Abbreviations

n. name
n. nom.
n. rank
n. sect.
n. comb.
n. sp., nov. spec., spec. nov.
n. ssp., n. subsp.
n. gen., n.g., gen. nov.

= neuer Name, Rang, Sektion, Art, Unterart, Gattung

Cardita costæirregularis, sp. nov.

PLATE 9, figs. 30, 31.

DESCRIPTION.—Shell strong, sub-triangular, closed, inequilateral, depresso-convex, length about 1/5th in excess of altitude; anterior region short, oblique, depressed with small lunule, posterior end produced, depressed, bearing a short and narrow ligament furrow; cardinal area small, dentition as in *C. costae-nodulosis*; sculpture exhibiting from 10-12 contiguous radial costae at each end, much depressed posteriorly, but anteriorly broad and well rounded, sides of the valves with two isolated, radial and rounded ribs divided by unequally wide furrows, surface of valves strongly and concentrically striated throughout, ventral margin widely plicated, anterior and posterior margins closely pectinated; internal surface radially swollen and furrowed.

Superorder Caenogastropoda Cox 1960

Order Architaenioglossa HALLER 1892

Superfamily Ampullinoidea COSSMANN 1918

Family Ampullinidae COSSMANN 1918

Genus *Warakia* n. gen.

Type species: *Warakia pilleri* n.sp., Oligocene, Oman.
Name: After the Oligocene Warak Formation.

Diagnosis: Large-sized ampullinid with heavy, bulbous columellar callus and a shoulder row of spiny nodes; inner lip callus weakly convex, almost flat with several prominent ridges. Surface smooth except for slightly prosocline axial plicae on the adapical part of the whorls and the aforementioned nodes.

Abbreviations

non
lat. = nicht
Das Wörtchen „non" in Synonymielisten bedeutet eine Verneinung.

Cerithium archiaci Vredenburg 1928

Plate 3, figs. 6–7, 14

1853 *Cerithium pseudocorrugatum* var c – d'Archiac & Haime, p. 299 (pars), pl. 28, fig. 7 (non *Cerithium pseudocorrugatum* d'Orbigny 1852).

1853 *Cerithium pseudocorrugatum* var b – d'Archiac & Haime, p. 299 (pars), pl. 28, fig. 8 (non *Cerithium pseudocorrugatum* d'Orbigny 1852).

1928 *Cerithium archiaci* Vredenburg, p. 356.

Abbreviations

nec, lat. = auch nicht, nicht einmal.

***Concavisporites* Pflug, 1953 emend. Delcourt & Sprumont, 1955**
1953 *Concavisporites* Pflug, Palaeontographica, B, 94, S .49 .
1955 *Concavisporites* Pflug, 1953, emend. Delcourt & Sprumont, Mem. Soc. Geol. Belgique, N . S . , 4, S. 22 .
nec 1962 *Concavisporites* Pflug. - Pocock, Palaeontographica, B, 111, S. 4 6 .

„nec" in Synonymielisten bedeutet eine völlige Ablehnung des nachfolgend genannten Zitats. Der Verfasser dieser Synonymieliste steht auf dem Standpunkt, daß die Gattung *Concavisporites* Pflug, wie sie von Pocock, 1962 aufgefaßt wird, ganz und gar nicht (also ein verschärftes „non") zum Titeltaxon gehört.

Abbreviations

nec, lat. = auch nicht, nicht einmal.

Das Kürzel „nec" wird auch in einer etwas anderen Art und Weise angewendet:
***Bartlingia* Brongniart, 1827 non Reichenbach, 1824 nec Mueller, 1877**

Das ältere Homonym zu *Bartlingia* Brongniart, 1827 wird durch ein vorausgehendes „non" gekennzeichnet, d.h. non *Bartlingia* Reichenbach, 1824, das jüngere Homonym durch ein vorausgehendes „nec", d.h. nec *Bartlingia* Mueller, 1877.

Abbreviations

pars, partim, pro parte
part, lat. = Teil; partim, lat. = zum Teil; pro parte, lat. = für einen Teil.

***Calcarata vindobonensis* (Hilber, 1892)**
2006 *Calcarata calcarata* (Brocchi, 1814) – Landau et al., p. 71 pars, pl. 5, only figs 2a-c.

pers. comm.
persona communicavit, lat. = eine Person hat mir mitgeteilt.
Im Sinne von „persönliche Mitteilung".

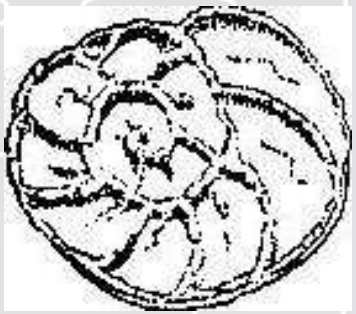
& Dobberteen, 1981). In an occurrence seemingly analogous to the fossil brooding gastropods, D. R. Lindberg (pers. comm.) has found specimens of the Pliocene bivalve *Transennella* packed with young. Also in the Bivalvia, inferred sexual dimorphism in the form of shell convexity differences is attributed to a brooding habit in Cenozoic

Abbreviations

s. l., s. lat.
SENSU LATO, SENSU LATIORE, lat. = im weiten Sinn, im weiteren Sinn.
s. s., s. str.
SENSU STRICTO, SENSU STRICTIORE, lat. = im engen bzw. engeren Sinn.
Stensioina exsculpta

***Stensioina exsculpta* s.l.**
„s.l." bedeutet hier, daß die Art *exsculpta* eine große Variationsbreite besitzt, wobei man alle Varietäten zu dieser Art rechnen kann. Hier könnten auch mehrere Arten vermischt sein.

***Stensioina exsculpta* s.str.**
Da die Art *exsculpta* nach Ansicht mehrerer Autoren eine große Variationsbreite aufweist, ist hier die Varietät gemeint, wie sie in der Erstveröffentlichung der Art beschrieben wurde.



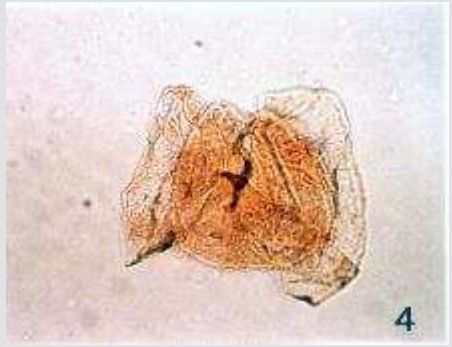
Abbreviations

sensu, sens.

SENSU, lat. = im Sinne von
***Kuylisporites lunaris* Cookson & Dettmann, 1958**
1958 *Kuylisporites lunaris* Cookson & Dettmann, S. 103, Taf. 14/21-23.
1963 *Kuylisporites lunaris* Cookson & Dettmann. - Brenner, S. 62 , Taf. 16/5 .
1982 *Kuylisporites lunaris* Cookson & Dettmann. - Medus, Taf. 5/8 (SENSU Brenner, 1963).

Medus, 1982 hat die Form *Kuylisporites lunaris* nicht nach der Originalbeschreibung von Cookson & Dettmann, 1958 bestimmt, sondern nach der Publikation von Brenner, 1963.
Damit kann angedeutet werden, dass die Form von Brenner nicht mit der von Cookson & Dettmann in der Artbeschreibung übereinstimmt, da Brenner die Art revidiert hat, oder dass Medus die Publikation von Cookson & Dettmann nicht vorlag, sondern nur die von Brenner.

Abbreviations



sic

SIC, lat. = so.

***Perotrilites striatus* Cookson & Dettmann, 1958**
1958 *Perotrilites striatus* Cookson & Dettmann, S. 108, Taf. 16/17-18 .
1963 *Perotriletes* [sic] *striatus* Cookson & Dettmann. - Brenner, Taf. 19/3 , Taf. 20/1.

***Perotrilites striatus* wurde von Brenner, 1963 irrtümlicherweise *Perotriletes striatus* geschrieben. Dies wird durch das Wörtchen „sic" ausgedrückt und üblicherweise innerhalb eckiger Klammern in das Original-Zitat eingefügt.**

Abbreviations

spec. inc. sed.
SPECIES INCERTAE SEDIS, lat. = Art mit unbestimmtem Platz.
Es handelt sich um eine Art, deren systematische Stellung unsicher ist.

spec. indet.; sp. indet.
SPECIES INDETERMINATA, lat. = unbestimmte Art.
***Dentalina* spec. indet.**
Der Autor konnte diese Form als Art nicht bestimmen, da z.B. diese Form zu schlecht erhalten war.

spec. inquir.; sp. inquir.
SPECIES INQUIRENDA, lat. = eine zu untersuchende Art. Man versteht darunter eine Art, die noch weiter untersucht werden muß, da sie aus irgendeinem Grund Zweifel aufkommen läßt, z.B. weil die Beschreibung zu ungenau und die Zeichnung zu schematisch ist.


FREAK
SHOW

Curiosities

There is no rule regulating the length of taxon names.

Species:

Parastratiosphecomyia stratiosphecomyioides **(a fly) – 42 char.**
Pseudotyrannochthonius octospinosus **(a pseudoscorpion) – 34 characters**
Notiocryptorrhynchus punctatocarinulatus **(a beetle) – 39 char.**
Pseudopityophthorus minutissimus **(a beetle) – 31 characters**
Ja ana **Ueno, 1955 (a beetle) – 5 characters**
Ia io **(a Chinese bat) – 4 characters**

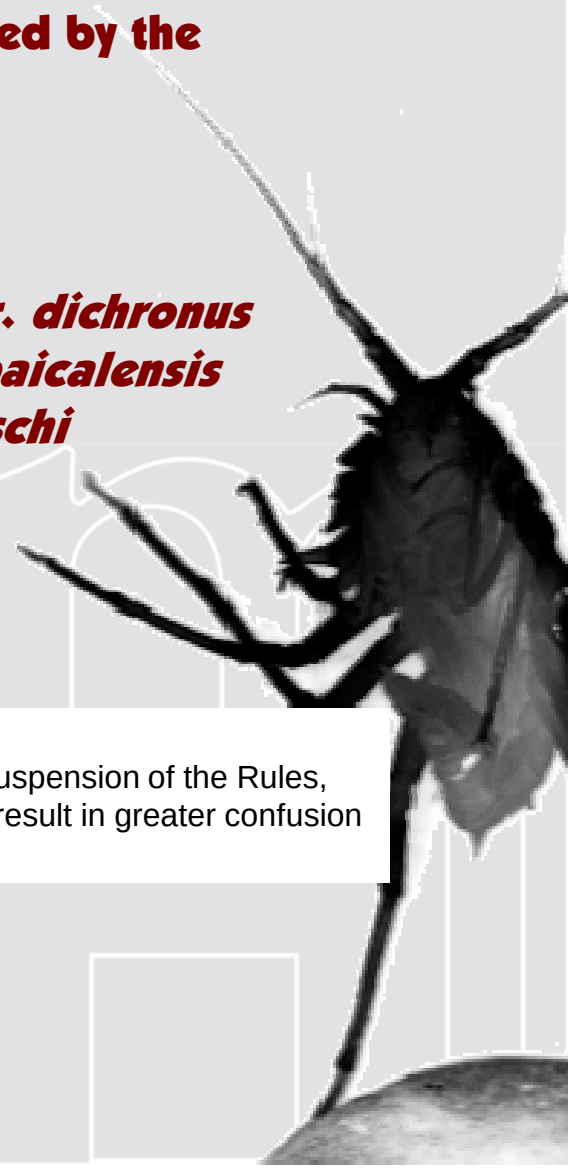
Genera:

Brassosophrolaeliocattleya **(a plant) – 26 characters**
Ips **(a beetle) – 3 characters**
Aa **(an orchid) – 2 characters**
As **(a beetle) – 2 characters**
Io **(an asteracean plant) – 2 characters**

Curiosities

Absurdly long names, however, have been rejected by the comission in the past.

Cancelloidokytodermogammarus
(Loveninuskytodermogammarus) loveni
Parapallaseakytodermogammarus borowskii* var. *dichronus
Gammaracanthuskytodermogammarus loricatobaicalensis
Siemienkiewieziechinogammarus siemienkiewitschi
Axelboeckiakytodermogammarus carpenteri
Garjajewiakytodermogammarus dershawini



ICZN Opinion 105
All names published in Dybowski's paper [...] are hereby suspended, under Suspension of the Rules, on the ground that the application of the Rules in accepting them "will clearly result in greater confusion than uniformity".

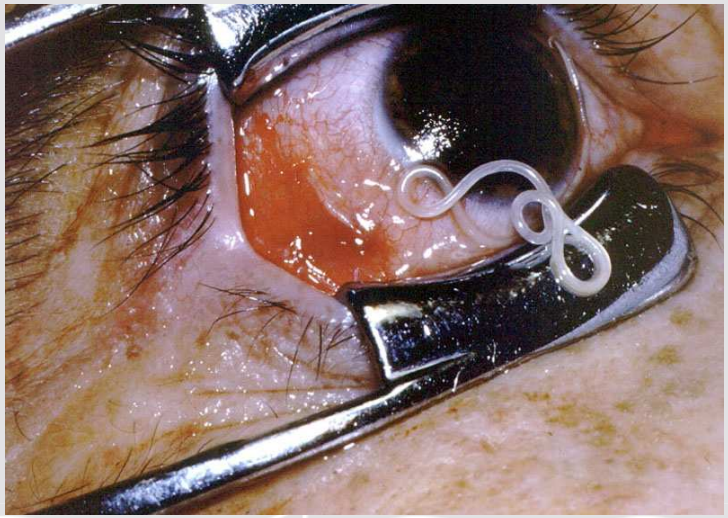
Dybowski, B. 1926. Synoptisches Verzeichnis mit kurzer Besprechung der Gattungen und Arten dieser Abteilung der Baikalflohkrebse. Bull. internat. Acad. polonaise Sci. Lett., 1926/1-2b: 1-77.

Curiosities

***Aha ha*, eine Grabwespe**
***Ia io*, eine Fledermaus**
***Loa loa*, ein Fadenwurm**
***Aa*, ein Weichtier**
und einer Orchidee

***Aaadonta*, Schüsselschnecke**
***Zyzzyxdonta*, Schüsselschnecke**

***Aaages*, Marienkäfer**
***Aaata*, Prachtkäfer**
***Ada aa*, eine Orchidee**
***Zyzza*, Zikade**
***Zyzzyx*, Grabwespe**



Curiosities

Palindrome

***Afgoiogfa*, Plattwespe**
***Aidemedia*, Kleidervögel von Hawaii**
***Allenella*, Nacktschnecke**
***Ajaja ajaja*, der Rosalöffler**
***Xela alex*, eine Schwebfliege**
***Orizabus subaziro*, ein Blatthornkäfer**

Antinome (Gegensätze)

***Elephantulus* – Elefantenspitzmaus**

Curiosities

Mantispa aphavexelte **von den österreichischen Entomologen Ulrike und Horst Aspöck als Name für eine lange Zeit auf Grund einer Verwechselung falsch bezeichneten Art aus der Familie der Fanghafte festgelegt.**

Denhama aussa **(österr: „Den haben wir raus"), eine australische Stabschreckenart, für die vom österreichischen Zoologen Franz Werner 1912 nach langwierigen Untersuchungen eine neue Gattung eingeführt wurde.**

Curiosities

Vallonia eiapopeia, Vallonia hoppla **(mit der Nominatunterart *V. hoppla hoppla*) und *Vallonia patens tralala* sind Grasschnecken (Familie Valloniidae), die 1996 von Jochen Gerber beschrieben wurden.**

***Vini vidivici*, ausgestorbener Papagei von den Marquesas, benannt nach Julius Cäsars Zitat Veni vidi vici.**

Curiosities

***Draculoides bramstokeri*, ein Zwerggeißelskorpion**

etc...

Curiosities

Trilobites

Norasaphus monroeae
after Marilyn Monroe

Mackenziurus johnnyi,
M. joeyi,
M. deedeei &
M. ceejayi,
after the Ramones

Parataxonomy

Parataxonomy

in Life sciences:

Parataxonomy is the use of less qualified assistance to, or replacement of, taxonomists in the practice and science of classification.

Generally parataxonomists work in the field, sorting collected samples into recognizable taxonomic units (RTUs) based on easily recognised features.

The process can be used alone for rapid assessment of biodiversity

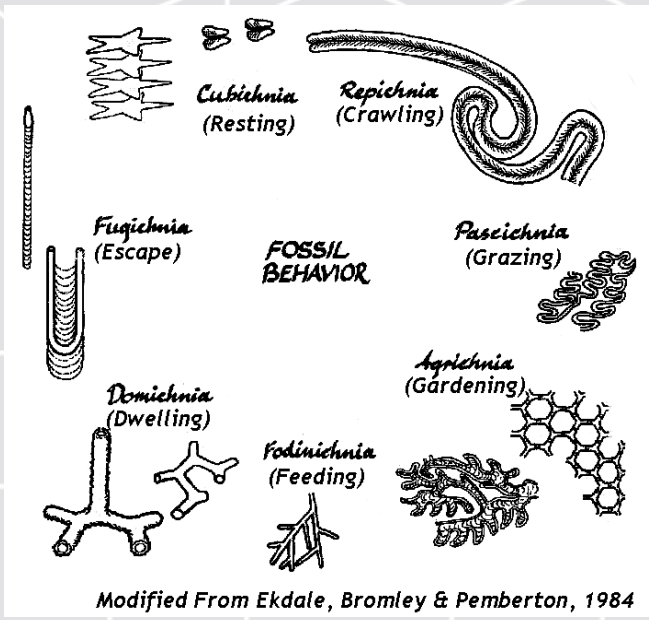
Parataxonomy

in paleontology:

Parataxonomy

traces (ichnofossils)
eggs
fossil embryos
isolated parts of a "multi-element" organism

taphonomic influence (preservation)



Modified From Ekdale, Bromley & Pemberton, 1984

RESEARCH NOTE

Paranomenclature and the rules of Zoological Nomenclature - with examples from fossil polychaete jaws (scolecodonts)

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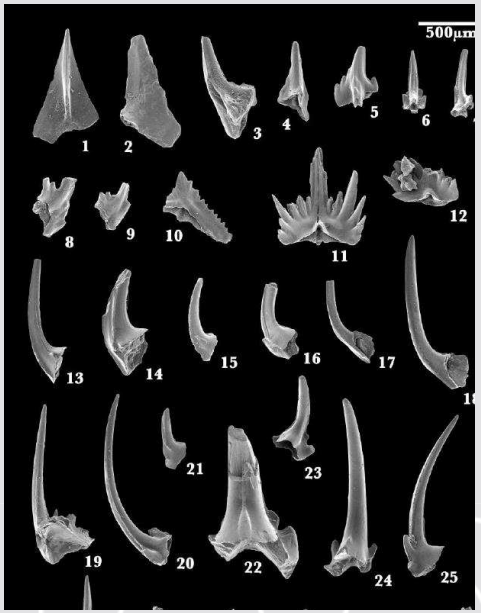
ABSTRACT: Names of zoological taxa are governed by a set of laws, the International Code of Zoological Nomenclature or ICZN. In contrast to taxonomy, where decisions are based on interpretations, the laws of nomenclature are explicit and must be obeyed. One of the consequences, as discussed herein, is that paranomenclature, that reflects parataxonomic classifications based on parts of organisms independently of other parts, is not recognized under the ICZN and thus cannot be applied to formally diagnosed taxa. In the case of jawed polychaete annelids, parataxonomic treatments of the jaw elements as well as ICZN-governed naming of the reconstructed apparatus has

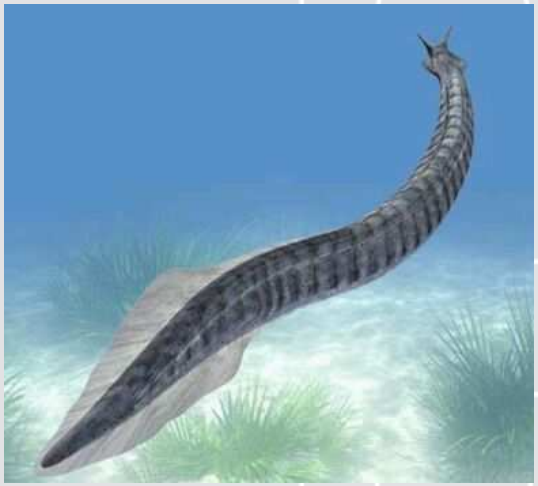
Parataxonomy

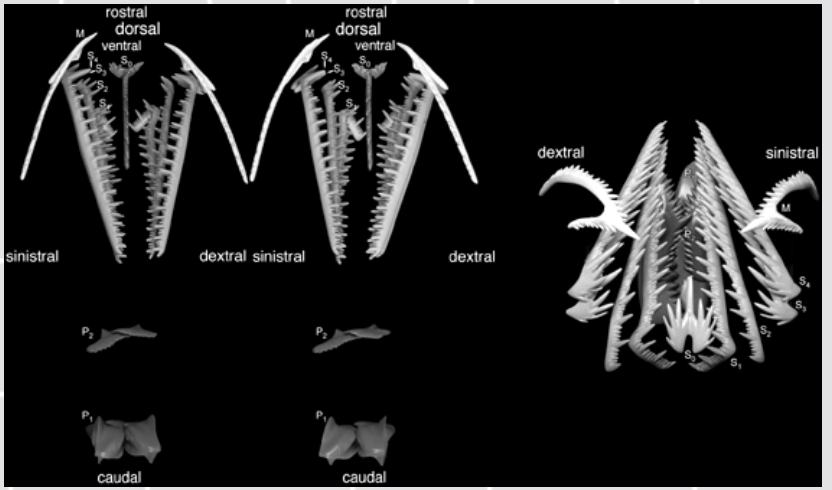
in paleontology:

Parataxonomy

traces (ichnofossils)
eggs
isolated parts of a “multi-element” organism





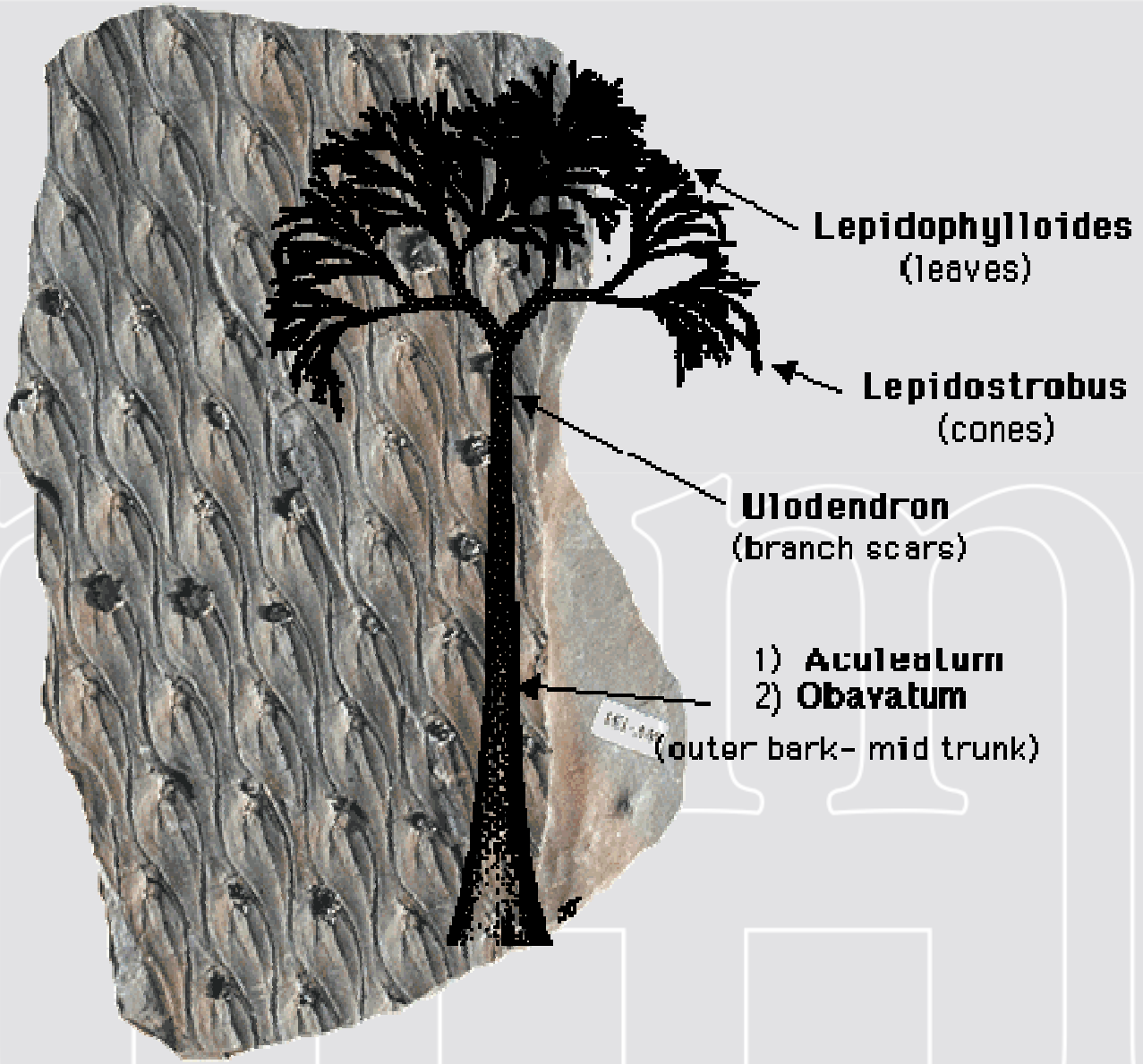


Parataxonomy

in paleontology:

Parataxonomy

taphonomic influence (preservation)



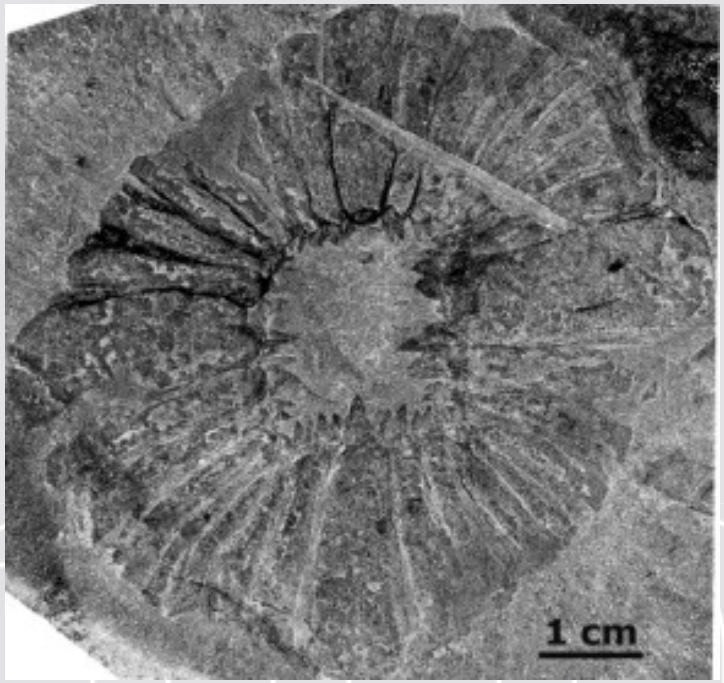
Parataxonomy

in paleontology:

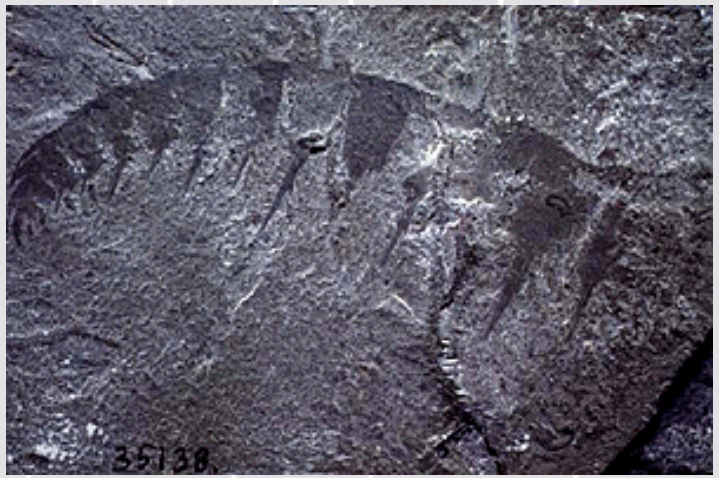
Parataxonomy

taphonomic influence (preservation)

***Peytoia*, Walcott, 1911**
a ring-like jellyfish



***Anomalocaris* Whiteaves, 1892**
"unusual shrimp"



Parataxonomy

PRIORITY

***Peytoia* W[illegible], [illegible]11**
a [illegible] jellyfish

***Anomalocaris* Whiteaves, 1892**
"unusual shrimp"