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NOMENCLATURE OF BIOLOGY

НОМЕНКЛАТУРА БИОЛОГИИ

The purpose of the paper is to provide students with an overview of nomenclature principles, methods and tools and to guide the students in the process of nomenclature acquisition. Being a part of the ESP of Biology nomenclature presents a specific naming system, the aim of which is giving an unambiguous and ubiquitous definition of the biological object. The present paper would be helpful for undergraduate and postgraduate students of Biology; it also aims at possibility of offering self-study courses for mastering effective communication in special languages.

Цель данной статьи – дать студентам возможность ознакомиться с явлением номенклатуры, ее сущностью, устройством, методами и средствами ее существования и функционирования на примере номенклатуры биологии. Как часть английского языка для специальных целей номенклатура представляет собой специфическое системное лексическое образование, целью которого является наименование биологического объекта. Номенклатурная единица является кодом, который содержит информацию о месте данного объекта в системе объектов данной науки. Данная статья может быть рекомендована студентам и аспирантам биологических факультетов в качестве краткого обзора по вопросам состава Английского языка для специальных целей и дальнейшего самостоятельного освоения литературы по специальности на английском языке.

Keywords: nomenclature, ESP, naming system, biological object.
Ключевые слова: номенклатура, АСЦ, наименование, биологический объект.

Scientific areas are concerned with observation and description of a large number of natural phenomena. This is inherent for biological sciences, geology, mineralogy, chemistry, and to lesser extend medicine. The primary need for any natural science is to order and classify its objects for further identifying according to the specific features of the objects. The features are taken to form types and classes in order to present the items of the scientific area in a more reliable and comprehensive way. Without classifying neither meaningful generalization could be made nor further experiments could be suggested.

The taxonomic sciences use artificial languages exploiting the systematic nature and the classificatory principle of language. The functions of language are narrowed and restricted to construct name systems and rules for their implementation.

The authority scientists have formulated general principles based on different criteria of classification for naming the objects of taxonomic sciences. In biology the genus-species relations are in the focus of classification of animals and plants; in medicine, especially, in anatomy, part-whole relations are employed to distinguish the objects; in pathology and physiology – processes, causes, procedures and effects are used. In chemistry the main goal of the nomenclature is to differentiate elements from compounds and substances.

The rules for naming the objects formulated above are based on the pragmatic principles:
existing names should be retained wherever possible;
names should be unique, univocal, simple and concise;
existing usage should be the arbiter in the case of choice between alternate designations, e. g. *Valva mitralis* coexists with *Valva atrioventricularis sinistra*;
rules should be capable with the progress of science;
trivial names should be replaced by systematic ones, e. g. *Ductus mesonephricus*, not *Wolffian duct*;
the rules should be acceptable to different languages which are not Latin or Greek in origin should be adaptable to different languages [1].

The aim of biology nomenclature is to express generic relationships between living organisms. The centre of the nomenclature is a binomial code containing a genus and a specific name (noun) e. g. *felis leo*; (an attribute) *Passer Domesticus*; (proper name) *Rosa beatricis*. The three major codes in bio nomenclature are for bacteriology, botany, zoology. The name must be constructed according to the rules listed below:

prior names must be considered since the oldest legitimate and properly constructed name claim precedence under the Law of Priority;

the name must be accompanied by a full description of the new concept which lists the attributes and justifies its place in the rank of the taxonomic hierarchy;

the name must be published in an established journal which regularly presents additions to or modifications of the code [1].

Nomenclature from Latin nomenclatura, stands for “list of names, enumeration, register”. When speaking about the Scientific Nomenclature, we mean a set of scientific names used as a system in any branch of science to denote objects of study. Nomenclatures in biology and chemistry are the most developed and extensive. We take a closer look at the Biological Nomenclature, which is called the Binary.

The binominal, or binary, or binomial nomenclature is a method used to denote a species in biological systematics using a two-word name, which consists of a combination of two names: the name of the genus and the name of the species.

Carl Linnaeus introduced the binomial nomenclature into active use and established strict hierarchy rules between systematic categories.

the name of the genus is always capitalized;

a species name - always in lowercase;

in a text a binomen is usually written in italics;

a species name should not be given separately from the genus name. In some cases, a genus name may be abbreviated to a single letter or standard abbreviation [2].

According to the tradition established in Russia, the word combination of binomial nomenclature (from the English binomial) has spread in the zoological literature, and the binary or binominal nomenclature (from the Latin binominalis) in the botanical one. In the scientific names *Papilio machaon* and *Rosa canina* the first word is the name of the genus to which these species belong, and the second word is the name of the species or specific epithet. An abbreviated reference to the author and the work, in which these species were first described and provided with a name given according to certain rules, is often placed after the binomen [3].

Examples of abbreviated names used by default for well-known laboratory organisms or for listing species of the same genus: *E. coli* (*Escherichia coli*), *S. cerevisiae* (baker's yeast, *Saccharomyces cerevisiae*) [4].

The binary nomenclature that we know and use today has taken shape in the second half of the 18th and early 19th centuries. Before that, rather long (polynomial) names were used, that was extremely inconvenient. For example, one of the mosses was called *Muscus capillaceus aphyllos capitulo crasso bivalvi*, that is, Moss in the form of a hair, leafless, with a thickened bivalve head. Such name said more about the form rather than current one; *Leafless Buxbaumia aphylla*: it contained all the main identifying features of the species.

The first biological concept of the species was given by the English naturalist John Ray (1686); it was presented in his work “Historia plantarum generalis”. However, the names of species in the Ray system did not depend on their position in the classification, and the very dissimilar plants could have names starting with the same word. Thus, Ray attributed *Malus persica* (peach) and *Malus aurantium* (bitter orange) to different groups (plum and apple bearing trees, respectively), but did not change the established names, starting with *Malus* (apple) [5]. Later, in the works of Augustus Bachmann (1690) and Joseph Pitton de Turnefort (1694), a system of co-ordinated categories was introduced. The most detailed was the Pitton de Tournefort ranking system: class - section - gender - species. the categories of the genus and species were clearly separated and for the first time the principle “one genus - one name” was applied [6].

The use of verbose names in practice was associated with certain difficulties. In this regard, the transformation of the nomenclature was one of the most important proposals of Carl Linnaeus. From the mid-1740s, they began experimenting with so-called trivial names (lat. nomina trivialia). The invention and application of nomina trivialia was limited only by two rules: they could not have been repeative within the genus and they could not change after adding new species to the genus. For the first time Linnaeus consistently applied nomina trivialia to all plant species in Species Plantarum (1753) [2].

The practice of using binomen was fixed by the first nomenclature codes, that appeared in the 1840-1860s. The need to develop codes governing the formation of new names and the use of old ones was associated with the growing nomenclature chaos.

The first nomenclature rules were developed in England in 1842. In all codes, the scientific name of a species is considered to be a binomial name Biological nomenclature codes - sets of rules governing the formation and use of scientific names of organisms.

The main content of the codes is a series of numbered rules or articles. Some of the paragraphs are supplemented with recommendations. Changes in codes are accepted at relevant international congresses.

Biological nomenclature codes differ in details, but their main features are common:

1. codes require all scientific names to be in the Latin form, that is written in letters of the Latin alphabet and obey the rules of the Latin grammar;
2. the names of taxa at the rank consist of one word;

In order for the taxon rank to be clear from its name, codes in many cases set conditions according to which the name of a taxon in a certain rank must have a definite ending. For example, all taxa in botany in the rank of order must have an ending *-ales*.

3. names of species consist of two words - the name of the genus and the species name;
4. the second word can be an adjective or a noun in the genitive case [7], [8], [9].

To sum up the point, nomenclature of Biology is not a list of terms used in the science, but a list of rules used in the science for naming biological objects. The name lists the attributes of the object and justifies its place in the rank of taxonomic hierarchy. The name must be published in the established journals where all additions or modifications of the code are presented.

The tutorial purpose of the paper is to evoke an interest to the big part of the ESP of Biology, which is nomenclature, or the system of nomenclature units. It aims at providing the students of science with information on some features of biological nomenclature, its specific evolving and functioning. The material may serve as a preliminary step to further study and understanding the language of Biology for being able to work with reference literature in English.

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ИСПОЛЬЗОВАНИЕ ЦИФРОВЫХ ИСТОРИЙ КАК СПОСОБ АКТИВИЗАЦИИ САМОСТОЯТЕЛЬНОЙ РАБОТЫ СТУДЕНТОВ ПРИ ИЗУЧЕНИИ ИНОСТРАННОГО ЯЗЫКА

USING DIGITAL STORIES AS A WAY TO ENHANCE STUDENTS' INDIVIDUAL WORK IN FOREIGN LANGUAGE LEARNING

Интенсивное развитие информационно-коммуникационных технологий предполагает использование в учебном процессе новых методик, которые будут являться мощным средством для стимуляции самостоятельной работы студентов при изучении иностранных языков. Цифровое повествование представляет собой комбинацию изображений с различными мультимедиа средствами, включая графику, аудио, видео и веб-публикации. Выполнение заданий, направленных на создание цифровых историй, мотивирует студентов на самостоятельный поиск, обработку и анализ различных данных. Работа с мультимедийным контентом инспирирует самообразовательную деятельность, способствует развитию инфокоммуникационной и лингвистической компетенции. Статья рассматривает роль цифровых историй в самостоятельном освоении словарного запаса студентами неязыковых направлений. Анализ полученных результатов показал, что цифровые истории значительно улучшают усвоение и сохранение вокабуляра учащихся.

The intensive development of information and communication technologies implies the use of new techniques in the educational process, which will be a powerful means to stimulate students' individual work in foreign languages study. Digital storytelling is a combination of images with various multimedia means including graphics, audio, video, and web publishing. Tasks aimed at creating digital stories motivate students to independent search, process, and analyze various information. Work with multimedia content inspires self-educational activity, contributes to the development of infocommunication and linguistic competence. The article deals with the role of digital stories in vocabulary self-mastering by students of non-linguistic specialties. Analysis of the results showed that digital stories improve the learning and preservation of students' vocabulary.

Ключевые слова: иностранные языки, самостоятельная работа, мотивация, информационно-коммуникационные технологии, мультимедиа средства, цифровое повествование, словарный запас

Keywords: foreign languages, individual work, motivation, information and communication technologies, multimedia means, digital stories, vocabulary