How to Write Scientific Names of Organisms

General: Scientific names are Latin (or latinized) names assigned to particular organisms, living or extinct, based on binomial system of nomenclature. Although only one scientific name is valid for a given organism at a given time, certain organisms may have a few other scientific names, known as synonyms, which are still valid for a given period of time.

Scientific names are very useful to identify organisms in that a given scientific name is universally used for a particular organism throughout the world. On the other hand, an organism may have many common names and numerous other vernacular or local names in many languages. Furthermore, the same common or local name may be referred to two or more different organisms. However, it is quite difficult for the laymen to write/use scientific names.

The difficulties in using scientific names include the followings:

- Scientific names are written in Latin language which is not familiar to the laymen, thus difficult for them to comprehend and memorize, especially for those who do not understand English or other romanized languages.
- Taxonomists, i.e. those scientists who study nomenclature (assigning the names), classification and identification of organisms, do not pay much attention to organic evolution, phylogeny and genetics. Thus, they based their judgement on the morphology and stick their ideas to the old concept of species. For example, *Musa sapientum* and *Musa paradiasiaca* have been used as scientific names of the bananas since the time of Linneaus in spite of the fact that it is now well known that all edible bananas are of hybrid origin, having their genomes derived from two wild species, *Musa acuminata* and *Musa balbisiana;* thus both scientific names are no longer valid.
- Other biologists do not pay attention to taxonomy and other field of biology other than that of their own. For example, some Thai pharmacologists still use *Mentha arvensis* as the scientific name of kitchen mint as well as of Japanese mint (whereas they should be called *Mentha cordifolia* and *Mentha arvensis* var. *piperascens*, respectively).
- The formation of intergeneric, interspecific and intraspecific hybrids creates difficulty for taxonomists to give the name of these hybrids, especially when no pedigrees are known.

International Codes of Nomenclature: In order to have a standard system of naming organisms, international meetings among taxonomists of major groups of organisms have been organized on regular intervals (about 4-5 years) to establish / adopt international codes of nomenclature for these organisms. There are four such codes, namely: (1) International Code of Zoological Nomenclature, (2) International Code of Botanical Nomenclature, (3) International Code of Nomenclature of Bacteria and Viruses, and (4) International Code of Nomenclature of Cultivated Plants.

Taxonomic Hierarchy: A system of classification of organisms is based on taxonomic hierarchy, i.e. different levels of groups of organisms. For example, on the top-most level, it is 'Kingdom' (of which there are two, Animal and Plant). The next lower level from 'Kingdom' is 'Phylum' (for animals) or 'Phyta' (for plants). Lower down the levels are: 'Class', 'Order', 'Family', 'Genus' and 'Species'. Thus:

Kingdom: Animal / Plant
Phylum / Phyta:
Class:
Order:
Family:
Genus:
Species:

The Rules of Writing Scientific Names:

Binomial System: Using two names, generic name (name of the genus), and specific epithet (name of the species). For example, human beings are given the scientific name of *Homo sapiens*, lion - *Felis leo*, rice plant - *Oryza sativa;* colon bacteria - *Escherichia coli.*

Trinomial System: In certain cases, there is a need to add a third name to the binomial to provide further information of the organism. These are names of subspecies, races, forms, cultivar groups (cv.gr.), etc. For example, the scientific name of gorilla is *Gorilla gorilla gorilla* (the third name is a subspecies); *Oryza sativa indica* is a trinomial for long grain rice; *Vigna unguiculata* cv.gr. *sesquipedalis* for yardlong bean.

Author's Names: These are the names of the taxonomists who were the first persons who gave the names to a given organism. It is placed at the end of the binomial, and often abbreviated.

Other Names: These are names not considered as part of scientific names, but they provide useful information about the organisms. They are given to domesticated animals and cultivated plants to provide further information about them. These include strains, lines, clones, ecotypes, etc. In certain scientific manuscripts, such names are required.

Guidelines in Writing Scientific Names:

1. Capitalize first letter of generic name, while the rest, including the whole of specific epithet, in small case. Leave a single space between generic name and specific epithet. In case where the author's name is to be included, use standard abbreviation for the authors' name.
2. Use *italics* for generic name and specific epithet, but not the author's name. In hand-written manuscript, or when use a typewriter with no *italics*, underline what are to be italicized.
3. Names lower than species level are to be treated in the same way as the binomial, i.e. italicized; note that the word subspecies, race, variety, forms, etc. which are abbreviated, are not italicized. The same is true for strains or lines of domesticated animals; varieties, clones, and ecotypes of cultivated plants; trade or registered (grex) names, which are not italicized.

Exception to the Rules:

1. When used in the title or main heading, the full scientific name can be written in block letter (i.e. capitalized), and can either be italicized or not. The type font should be the same as that of the title or main heading.
2. When appeared together in a paragraph where type font is *italic,* scientific name may be written in normal type font in order to make it distinct from the rest.
3. Use full scientific name when it first appears, then abbreviate generic name afterwards.

Suggestions on the Use of Scientific Names:

1. Whenever a scientific name is used, it should be accompanied by two other names (if available), i.e. common name and local or vernacular name.
2. In paper for general public, however, try to minimize the use of scientific names. Common and local names should be used instead.
3. In all scientific papers, author's names should be used, at least in the first appearance, in order to facilitate taxonomic study, especially when there is a change of generic or species name.

The Use of Part of Scientific Names in Adjective Form or as a Common Name:

1. Generic name can be transformed into an adjective, e.g. rhizobial activities, vandaceous orchid; or used as a common name, e.g. dendrobium, eucalyptus (derived from generic names).
2. Specific epithet can also be transformed into adjective form, e.g. acuminata type; or used as a common name, e.g. longan (a species of *Dimocarpus*), ginseng (a species of *Panax*).
3. Subspecific name can also be transformed into adjective form, e.g. *zebrina* derivative, *indica* type.