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The Taxa of the Higher Plants above the Rank of Order

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Subdivisio -icae — Examples: Magnolicae, Cycadicae.

Classis -atae — Examples: Marchantiatae, Lycopodiatae, Cycadatae.

Subclassis -idae (from Greek -ides, similar) — Examples: Pinidae, Marsileidae.

If we introduce some intermediate taxon in the classification of plants, some additional word-elements could be adopted. Thus, the element -antes can be used for names of superclasses, -anae for names of superorders, etc.

The following proposals are made in relation to the names of taxa above the rank of order.

*Proposal 1.* Recommendation 16A to be read:

(a). The name of a division is taken either from character indicating the nature of the division as closely as possible, or from any generic name; it should end in -phyta. Words of Greek origin are generally preferable.

(b). The name of a subdivision based on some generic name (on a name of some type genus or its synonym) ends in -icae. Examples: Pinicae, Cycadicae.

(c). The name of a class is formed in a similar manner by adding -atae. Examples: Lycopodiatae, Marchantiatae.

(d). The name of a subclass is designated in a similar manner with -idae. Examples: Marattiidae, Pinidae.

*Proposal 2.* If any intermediate rank of taxon is introduced in the classification of plants some additional ending may be used: -antes for names of superclasses, -anae for names of superorders, etc.

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## THE TAXA OF THE HIGHER PLANTS ABOVE THE RANK OF ORDER

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In the systems of classification of the higher plants proposed during the last decades there reign extraordinary differences of opinion on the content and size of the higher taxa as well as on their nomenclature. There is even no generally accepted name for the higher plants. Though such lack of agreement in the designation of the higher taxa has no great importance in research work on systematics, it is still somewhat disturbing in tutorial activities both for teachers and students, by adding unnecessary difficulties to the study of systematics. This muddle considerably increased after 1952 when in the International Code of Botanical Nomenclature there were introduced rather unfortunate recommendations to use the ending -phytina for subdivisions and the ending -opsida for the classes.

As Mrs. Nora Zabinkova correctly states in her paper contributed to this number of Taxon, it is inadvisable to form names of taxa from generic names by means of the

elements -phytina and -opsida. I would like to add that it is most undesirable to derive the endings of both divisions and subdivisions from the same word phyton. It is better to leave the endings derived from phyton only for divisions, as their number is very limited, thus decreasing the difficulties mentioned in Mrs. Nora Zabinkova's article. But if the objections to the ending -phytina are mainly of a philological character, the ending -opsida is also incorrect from the historical point of view. The thing is that the -opsida ending was proposed by Jeffrey (1899, 1902) for his "stocks", or "great natural phyla of vascular plants", which are nearer to modern divisions (and even to groups of divisions, as his Lycopsida), than to classes. Later, D. Scott (1909), who divided all the vascular plants into Lycopsida, Sphenopsida and Pteropsida, considered them to represent divisions. Many further authors also called them divisions. Some other authors, as for example A. Foster and E. Gifford (1959) and Th. Delevoryas (1962) called them subdivisions. I. Tippe (1942), E. Core (1955), C. Villee (1957) and some other American authors, used them for subphyla, which are equivalent to subdivisions (Cronquist, 1960). Thus, the original meaning of Lycopsida, Pteropsida and all other "opsida" was the designation of the major taxa of higher plants. That is why it is inappropriate to use the -opsida ending to indicate classes. Dr. A. Cronquist (1960) is therefore quite right in not accepting this recommendation of the International Code.

Thus, there is a real necessity for thinking out a reasonable ending for classes. As Dr. Cronquist (1960) points out, the most familiar class endings among the higher plants are -ae, -eae and -inae. But as in the current edition of the rules, the -eae ending has been reserved for tribes, and the -inae ending for subtribes, he comes to the conclusion that only the -ae ending remains available as a standard for classes (Psilotae, Cycadae, Equisetae, etc.). At first I was in agreement with Cronquist and was even going to come out in favour of his proposal. But when I discussed this question with Mrs. Nora Zabinkova, a specialist in classical philology, particularly engaged now in botanical terminology, I was told that the immediate addition of the endings to the stems of the words without a suffix is not suitable, as explained now in her article. In her opinion we cannot therefore add the ending -ae to the stems of generic names, as Dr. Cronquist does. Instead of it she proposes the ending -atae for classes, to which Dr. Cronquist does not object (personal communication). To my mind, this proposal is very apt and it may be hoped that many taxonomists will agree with it. In her article Mrs. Nora Zabinkova suggests also new endings for subdivisions, as well as endings for superclasses and superorders, all of which I think deserve acceptance. On the other hand H. W. Rickett and W. H. Camp (1950) proposed many years ago "to carry the type method throughout the entire range of categories of classification" and to use the generic names as the basis for names of the higher groups to which they belong. It would be preferable if we consistently derived all class names (as well as the names of the other taxa above the rank of order) from generic names — stems of the names of the lower taxa next in line, and discarded all the traditional names incompatible with this principle. Thus, names of classes must be derived from the stem of one of the included orders, names of subdivisions must be based on the stem of one of their classes, and names of divisions — on the stem of one of the subdivisions belonging to them. Applying this principle the whole system of classification becomes more consistent and logical, and simpler from the tutorial point of view.

When there are both fossil and living representatives in a given class, or subdivision or division, it is preferable to take the derivation of its name from the stem of living family. E.g. for the division of horsetails and their allies, the name Equisetophyta is much better than Sphenophyllophyta or Hyeniphyta.

In the system of classification I am proposing here there is additional systematic category superorder. This rank is not envisaged by the Code, but according to the rule we may intercalate or add any supplementary ranks, "provided that confusion or error

is not thereby introduced" (Article 4). I hope there will be no "confusion" or "error" if we introduce the terms made by adding the prefix super- (along with the terms made by adding the prefix sub-, envisaged by the Code), which is so familiar in zoological nomenclature, but extremely rare in botany.

Regarding the names of subkingdoms, the majority of the proposed names must be discarded on account of the element -phyta being used for them, which is quite inappropriate, for in these cases the endings of subkingdoms appear the same as those of divisions. Therefore the names Cormophyta, Embryophyta, Stelophyta, Tracheophyta, Telomophyta should be rejected. The ending -bionta, which was proposed by the late Prof. W. Rothmaler (1948) and accepted by Prof. W. Zimmermann (1959), seems to Mrs. Zabinkova and me the most suitable for subkingdoms. But instead of Cormobionta of Rothmaler I should prefer Telomobionta, which is more correct from the morphological point of view.

Next follows a conspectus of the taxa of Telomobionta above the rank of order. The traditional names are given as alternatives. The names of order are given only for the angiosperms (Magnoliceae), as without them the size of the superorders would be incomprehensible.

#### Subregnum Telomobionta (Cormobionta)

1. Divisio Psilophyta  
    Classis Psilophytatae
2. Divisio Bryophyta  
    Classis Anthocerotatae  
    Classis Marchantiatae (Hepaticae)  
    Classis Bryatae (Musci)
3. Divisio Lycopodiophyta (Lycophyta, Lepidophyta)  
    Classis Lycopodiatae  
        Subclassis Asteroxylidae  
        Subclassis Lycopodiidae  
    Classis Isoetatae  
        Subclassis Selaginellidae  
        Subclassis Isoetidae
4. Divisio Psilotophyta  
    Classis Psilotatae
5. Divisio Equisetophyta (Sphenophyta, Calamophyta)  
    Classis Hyeniatae  
    Classis Sphenophyllatae  
    Classis Equisetatae
6. Divisio Polypodiophyta (Pteridophyta s.str., Pterophyta s.str.)  
    Classis Polypodiatae (Filices)  
        Subclassis Protopterididae (Primofilicidae)  
        Subclassis Archaeopterididae  
        Subclassis Ophioglossidae  
        Subclassis Noeggerathiidae  
        Subclassis Marattiidae  
        Subclassis Polypodiidae (Filicidae)  
        Subclassis Marsileidae  
        Subclassis Salviniidae

- 7. Divisio Magnoliophyta (Spermatophyta)
  - A. Subdivisio Lyginopteridicae (Pteridospermae)
    - Classis Lyginopteridatae (Cycadofilices)
  - B. Subdivisio Pinicae (Coniferophytina)
    - Classis Ginkgoatae
    - Classis Pinatae
      - Subclassis Cordaitidae
      - Subclassis Pinidae
  - C. Subdivisio Cycadicae (Cycadophytina)
    - Classis Cycadatae
    - Classis Bennettitatae
  - D. Subdivisio Gneticae (Chlamydospermae, Gnetophytina)
    - Classis Gnetatae
  - E. Subdivisio Magnolicae (Angiospermae)
    - Classis Magnoliatae (Dicotyledones)
      - Subclassis Magnoliidae
        - Superordo Magnolianae
          - Magnoliales, Laurales, Piperales, Aristolochiales, Nymphaeales, Nelumbonales, Illiciales, Ranunculales, Papaverales, Sarraceniales
        - Subclassis Hamamelididae
          - Superordo Hamamelidanae
            - Trochodendrales, Hamamelidales, Urticales, Casuarinales, Fagales, Betulales, Balanopales, Myricales, Juglandales, Leitneriales
          - Subclassis Caryophyllidae
            - Superordo Caryophyllanae
              - Caryophyllales, Polygonales, Plumbaginales
            - Subclassis Dilleniidae
              - Superordo Dillenianae
                - Dilleniales, Theales, Cistales, Passiflorales, Datiscales, Capparales, Tamaricales, Salicales
              - Superordo Ericanae
                - Ericales, Ebenales, Primulales
              - Superordo Malvanae
                - Malvales, Euphorbiales, Thymelaeales
            - Subclassis Rosidae
              - Superordo Rosanae
                - Rosales, Cunoniales, Saxifragales, Podostemales, Fabales
              - Superordo Myrtanae
                - Myrtales, Haloragales
              - Superordo Rutanae
                - Rutales, Sapindales, Geraniales, Polygalales
              - Superordo Aralianae
                - Cornales, Araliales
              - Superordo Celastranae
                - Celastrales, Rhamnales, Santalales, Proteales
            - Subclassis Asteridae
              - Superordo Lamianae
                - Gentianales, Rubiales, Polemoniales, Scrophulariales, Lamiales
              - Superordo Asteranae
                - Campanulales, Asterales

Classis Liliatae (Monocotyledones)  
   Subclassis Alismatidae  
     Superordo Alismatanae  
       Alismatales, Hydrocharitales, Potamogetonales, Triuridales  
   Subclassis Liliidae  
     Superordo Lilianae  
       Liliales, Bromeliales, Iridales, Dioscoreales, Zingiberales, Haemodorales, Orchidales  
     Superordo Juncanae  
       Juncales, Cyperales  
   Subclassis Commelinidae  
     Superordo Commelinanae  
       Commelinales, Eriocaulales, Restionales, Poales  
   Subclassis Arecidae  
     Superordo Arecanae  
       Arecales, Cyclanthales, Arales, Pandanales

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