

PROPOSED ADDITIONS TO THE INTERNATIONAL RULES OF BOTANICAL NOMENCLATURE

adopted by the
FIFTH INTERNATIONAL BOTANICAL CONGRESS,
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By

W. JONGMANS, T. G. HALLE, W. GOTHAN.

The rules adopted by the Fifth Botanical Congress ought to be amended in several respects in order to avoid intolerable confusion as a result of their application to fossil plants. The special character of the paleobotanical material has led of necessity to the establishment of a generally accepted custom; if this is disregarded, the whole paleobotanical nomenclature will become disorganized.

We have considered the different questions and hope that the following proposals may help to overcome the greatest difficulties. We add some remarks and examples to our proposals to elucidate our opinion.

For complete text of rules vide: The Journal of Botany, June, 1934.

I. Chapter II. CATEGORIES OF TAXONOMIC GROUPS.

Art. 11. **Add:**

Since the species, and consequently the genera of fossil plants are usually founded on specimens of detached organs, and the connection between two or more of these organs can be proved in special and rare cases only, and much uncertainty exists in the reconstruction of many fossil species, *organ genera* and *artificial genera* (*form genera*) have to be distinguished as categories within which species are recognised.

An *organ genus* is a genus established for detached parts belonging to the same morphological category. An *artificial genus* („*form genus*“) is a genus which is known to contain generically unrelated species, but which is retained as a matter of convenience in order to provide a possibility of giving binominal names to specimens of uncertain taxonomical relationship.

Remarks.

It is inevitable that detached organs of fossil plants receive specific and generic names. Nearly all genera of fossil plants are in fact founded on separate organs, complete fossil plants being exceedingly rare. In most groups of fossil plants such specimens are not known and cannot be expected to be found. In some cases two or more genera representing different categories of organs may be proved to belong to the same natural genus. But on the other hand it may happen that two or more species referred to the same organ genus prove to belong to different natural genera. (In genera founded on Fern-leaves, for instance, the discovery of essentially different fructifications in organic connection with the leaves may prove that the species belong to different genera in the ordinary taxonomic sense).

1. *Organ genera*. In describing organ genera it should be clearly indicated for which kind of organ the genus is established. It is desirable, when possible, that the name indicates the category of the organ. (For leaves a combination with *phyllum*, for fructifications with *carpus*, *theca* etc.)

2. *Artificial genera* (generally known as „*form genera*“ in the paleobotanical literature) are as a rule such organ genera which have been proved to contain species that are not generically related in the ordinary taxonomic sense. An *organ genus* becomes an *artificial (form) genus* on the forthcoming of proof to that effect.

Examples.

The most common artificial genera are those established by AD. BRONGNIART in order to provide a system for naming sterile leaves of Fern-like plants, the genera being founded on characters from the shape and venation, which in recent Ferns recur in different genera and even families.

Well-known examples of such genera are, for instan-

ce, *Pecopteris* and *Sphenopteris*. These were founded on the characters of the sterile leaves, but various species have later been found with sporangia. For these fructifications organ genera have been established, and it has been proved that each of the genera of sterile leaves contains species which, in regard to their fructifications, belong to different organ genera. The names *Pecopteris* and *Sphenopteris* must, however, be retained as artificial genera to provide a place for those species — still forming the majority, — which are only known in the sterile condition.

b. As soon as the connection between two provisional genera of fossil plants, whether organ genera or artificial (form) genera, has been proved, a new generic name, *combination genus*, should as a rule be introduced for the combination (comp. Art. 16, footnote).

The same if an organ (e.g. a fructification) has been described independently, and it is proved afterwards that one or more species belonging to some form genus bear this same organ, the introduction of a combination genus is necessary.

Example:

Parts of the same natural species have been described under the following generic names:

Form genus:

Sphenopteris (*Hoeninghausi*).

Organ genera:

Lyginodendron. (*Lyginopteris*).

Lagenostoma.

Calymmatotheca.

Kaloxylon.

As combination genus could be used f.i.:

Lagenopteris.

c. In descriptions or lists both the *artificial genera* (*form genera*) and *organ genera* must be mentioned. It is of little importance whether the author puts the artificial genus (*form genus*) first or the organ genus.

Example:

In some coalmines *Pecopteris plumosa* is found as sterile and fertile leaves. In this case the plant must be quoted as:

Pecopteris (Dactylotheca) plumosa.
or: *Dactylotheca (Pecopteris) plumosa.*
but never as: *Dactylotheca plumosa.*

II. Chapter III. NAMES OF TAXONOMIC GROUPS.

Section I. GENERAL PRINCIPLES: PRIORITY.

Art. 16.

Remark.

In fossil botany a group with a given circumscription may be an *organ*, or an *artificial (form)* or a *combination genus* (vide Chapter II, Art. 12a).

Art. 16. **Footnote.**

In essential agreement with British paleobotanists we propose the following addition:

In *organ genera* and *artificial (form) genera* of fossil plants the valid name is the earliest published name used for a group of specimens with the same position and rank, and this must be applied only to those organs of the plants for which the name was originally used; isolated organs of a different category must be placed in a different *organ genus* or *artificial (form) genus*.

If, in the course of reconstruction of fossil plants, two *organ genera* or *artificial (form) genera* are found to have been applied to parts of the same plant, they are still retained in their original sense and under their original names. For the reconstructed plant (combination) a new genus („*combination genus*”), more closely comparable to a natural taxonomic group, should, as a rule, be established under a new name (Comp. Art. 57b).

Art. 17.

Remark.

This has an important bearing on the nomenclature of fossil plants. The practice adopted by some authors of rejecting names because they imply false systematic affinities cannot be upheld. Thus such names as *Prototaxites* for an Alga and *Yuccites* for a Gymnosperm must stand.

III. Chapter III. Section 2. THE TYPE METHOD.

Art. 18. **add:**

In fossil plants the types are determined according to the following rules (a—c).

a. The *type of an organ genus* is the first described species which shows the characters necessary for distinguishing the genus from other groups. The *type of a species* is the first described and figured specimen showing all the characters necessary for distinguishing the species from other groups. If the specimen has been lost, the first figure showing the same characters should be taken as the type. If several specimens have been simultaneously figured without indication of the type, the specimen or figure which shows most clearly and fully the essential characters should be taken.

b. In describing new species it is necessary to mention which specimen is regarded as the type.

A new species described **after 1 January 1936** is not valid unless the type is specially noted.

It is desirable to indicate in which museum or collection the type is to be found.

c. If it is shown (by subsequent re-description or re-figuring) that the first description or figure of the type specimen of a species is incorrect or indistinct, the name attached to that specimen is not valid. By correct re-description or re-figuring *the name is validated but takes the date (and the author) of the correct description or figure.*

Remarks.

These rules are necessary in order to avoid alteration of many well-known names of species of which the first specimen (the type according to the present rules) was indistinctly or incorrectly figured with the result that it has not been possible to identify new material with it. The names now in general use should not be rejected because re-description or re-figuring of the incorrectly described or figured type of an obsolete name proves that type to belong to the same species. The exception from the general rules here proposed is necessary by the nature of the fossil material and the great rôle which illustrations play in paleobotany.

When the original figure does not show the principal characters of the species, it will, generally taken, not be possible to identify new material with this original figure and the old species will eo ipso be forgotten.

If an author refigures an old species with the right characters and combines his description with the old name for some reason, the author of the species refigu-

red under the old name is the new author and not the author who has published the inaccurate figure. The type of this species is that figure, which shows the right characters of those organs, which are mentioned in the description.

Example:

JAEGER described *Marantoidea* in sterile condition, did not mention or figure the marginal anastomoses of the nerves.

1858 SCHENK refers it to *Thaumatopteris*, on account of the fructification.

1865 As this name is not correct HEER proposes the name *Danaeopsis* (sterile and fertile).

1865 SCHENK publishes a figure of this new genus.

1904 LEUTHARDT discovers and figures the marginal anastomoses.

The right name is:

Danaeopsis (HEER, in SCHENK, emend) LEUTHARDT.

IV. Section 3. LIMITATION OF THE PRINCIPLES OF PRIORITY; PUBLICATION, STARTING POINTS; CONSERVATION OF NAMES.

Art. 20.

The nomenclature of Fossil plants of all groups begins with the year 1820 (recommandation of the last Congress).

Note.

On this basis it will be necessary to decide between SCHLOTHEIM's names and STERNBERG's names for certain plants. A list of *nomina conservanda* will be provided to legalise certain well known names like *Stigmaria ficoides*.

V. Section. 4. NOMENCLATURE OF THE TAXONOMIC GROUPS ACCORDINGG TO THEIR CATEGORIES.

§ 2, Art. 23. NAMES OF FAMILIES etc.

1. An *artificial (form) genus* in paleobotany is a former *organ genus*, sanctioned by long usage, which is known to contain unrelated species grouped together as a matter of convenience and to which specimens may be provisionally referred in the absence of characters indicating their taxonomic relationship; the names of such groups must only be

used with their original circumscription and no subsequent alteration of the diagnostic characters is possible; they are to be regarded as having no type species. Owing to the mixed and uncertain nature of these artificial (form) genera of fossil plants, such genera should not be associated in larger groups comparable to families (Suggested by british paleobotanists).

A list of artificial form genera will be provided.

Examples:

Sphenopteris, *Pecopteris*, *Cladophlebis*.

When necessary they may be associated in provisional or artificial larger groups ending, in agreement with paleobotanical custom, in syllables different from those used for ordinary taxonomic groups.

Example.

The artificial genera *Alethopteris* and *Lonchopteris* may, as hitherto, be associated in the provisional group *Alethopterides*.

2. In the same way as for fossil plants the *organ genus* and *combination genus* must be introduced, we can have *organ families* and *combination families*.

Example:

Among the *Lycopodiales ligulatae*, *Lepidodendron*, *Bothrodendron*, *Lepidophloios* are organ genera for stems, *Lepidostrobus*, *Bothrostrobus* for fructifications etc

The organ genera for the stems can be combined to the organ family *Lepidodendraceae*, those for the strobili to the organ family *Lepidostrobaseae*.

Both organ families have been combined to a combination family for which for practical reasons the name of the organ family *Lepidodendraceae* is used.

Art. 37. Add:

In fossil plants the name of a genus, or of a group of higher rank, published without being accompanied by a description or by a reference to a previous description, but characterized by enumeration of the groups of lower rank included in it, may be considered as validly published if the publication took place before **January 1, 1936**. After that date a description must be given.

Remark.

The names of several genera of fossil plants now in general use have been published in the past without descriptions. They ought not to be rejected solely for this reason.

Art. 39.

The article, proposed as art. 39, should be omitted.

VI. Section 6. CONDITIONS AND DATES OF VALID PUBLICATION OF NAMES.

Art. 42. Add:

From **January 1, 1936**, the name of a genus (*Organ genus*, *Combination genus*) of fossil plants is not considered as validly published unless it is effectively published and is accompanied by figures (or by references to such figures if already existing) showing the essential characters, in addition to the description.

VII. Art. 43. Add:

The name of a *monotypic genus* of fossil plants described **before January 1, 1936**, is validated by the provision of a combined generic and specific description accompanied by a figure showing the essential characters. After that date the author must also give a description of the genus indicating the difference from other genera.

Remark.

This is necessitated by the fact that many, perhaps most, new monotypic genera (generally taken organ genera) described till the present date have not been provided with generic diagnoses.

When other species are added to an undefined or ill-defined monotypic organ genus an emended generic diagnosis should be provided. The name of the later author must be added.

Art. 44. Add:

The name of a *species* or subdivision of a species of fossil plants is not considered as validly published unless it is accompanied by a figure showing the essential characters in addition to the description.

VIII. Art. 45.

For species or subdivisions of species of fossil plants, on and after **January 1, 1936**, the date is that of the simultaneous publication of the descriptions and figure (or, if these are published at different dates, the later of the two dates).

IX. Sect. 10. CHOICE OF NAMES WHEN TWO GROUPS OF THE SAME RANK ARE UNITED.

Art. 56.

Remark.

In Paleobotany this rule can be accepted for those names including the whole plant or the principal parts of it (f.i. leaves with fructification). All other genera in paleobotany are artificial (form) or organ genera. The purely artificial form genera have the destination to be broken up. If it is proved that two or more organ genera belong to the same plant they are united into a combination genus. For these combination genera the rule that when two or more are united the oldest legitimate name is retained, must stand.

X. Art. 57a (suggested by british paleobotanists).

Among fossil forms a plant which has been reconstructed by the association of fragments referable to different organ genera and bearing different names, must 1) be given a distinct *binominal name* to designate the plant as a whole (*combination genus* 2).

A generic name permanently associated with an organ genus should not be used for this purpose.

Note.

As to the last part of this suggestion there are several exceptions for practical reasons.

Lepidodendron and *Sigillaria* ab origine are organ genera especially for the stems. However they cannot be rejected as combination genus for practical reasons.

After Art. 57 add a new article:

Art. 57 b. If two organ genera or artificial (form) genera of fossil plants are found to contain parts (different organs) of the same plant, both genera must nevertheless be retained under their original names. For the combination of organs it is necessary, with the exception mentioned below, to establish a new genus („*combination genus*”) with a new name (comp. Art. 16, footnote). If in the course of re-

1) The original suggestion is: „should generally”. This however must be made compulsory.

2) Addition by the present authors.

construction of the plant other organs are added, the first valid name given to the combination of organs must stand, every additional organ genus found to contain parts of the plant being retained in its original sense and under its original name. A species of an organ genus should keep the earlier of the specific names of the two species first found to contain parts of the same plant. Addition of new species with earlier specific names does not justify a change of the specific name.

In certain well-known cases the name of an organ genus — usually that applied to the dominant or the most characteristic or well-known part — is generally used as a designation for the whole plant (for instance *Lepidodendron*, which was originally established as an organ genus for the stem). In some cases of this kind the practice of using an organ genus also for the whole plant should be legalized by the provision of a *list of recognized exceptions*.

Note.

A „combination genus” should only be established in cases of actual connection between two organs or, in exceptional cases, of absolute agreement in very characteristic structural details occurring in closely associated organs (e.g., *Sphenopteris Hoeninghausii* and *Lagenostoma Lomaxi* — in this case actual connection was later proved), but *never* on the grounds of mere association or other circumstantial evidence.

Remark.

It is hoped that the introduction of this proposed new article, in conjunction with the proposed additions to Articles 11 and 16, will help to overcome some of the greatest difficulties in paleobotanical nomenclature. We consider the provision of some kind of rule with the same general scope a necessary condition for the application of the international rules to fossil plants.

If parts of a plant which have been described as species of two different organ genera are found in connection, the earlier generic name, according to the present rules, will have to be accepted for the combination of organs. Whenever, in the course of reconstruction of the plant, another organ previously described under an earlier generic name is added, the name

of the genus will have to be changed. The resulting inconvenience will be aggravated by the fact that this risk of a repeated change of the name of the genus will chiefly affect those plants which present the greatest general botanical interest and are therefore most often mentioned in text-books.

The matter becomes still more complicated in the case of the so-called „*form genera*” (here termed „*artificial genera*”). The generic names most frequently occurring in paleobotanical literature are those applied to the great form genera established for sterile leaves of Fern-like plants agreeing in regard to the shape of the pinnules, venation etc. If a species of one form genus of this kind is found to bear a fructification previously known under a separate generic name, and the name of the form genus is the older — which will most often be the case — the name of the form genus will be applied to the combination of organs, and the possession of fructifications of more or less the same general type will be attributed to the whole form genus, since a genus in the ordinary taxonomic sense cannot have reproductive organs of essentially different types. If another species of the same form genus is later found to have a fructification of entirely different type, that species will have to be removed to another genus which may then take the generic name that may have been previously attached to the fructification. The same process may have to be repeated in the case of other species, and in this way the whole system of form genera, which is absolutely indispensable in practical paleobotanical work, will become disorganized.

The only practicable way out of the difficulties appears to us to be to retain the organ genera and form genera in their original definition, even though this implies the necessity of recognizing that a species (in the ordinary sense) of a fossil plant may belong to several organ genera or form genera and also to a „combination genus”.

It is recognized that the course here advocated will necessitate the establishment of a great number of new combination genera, but this inconvenience weighs lightly when compared to the disorganisation of the whole paleobotanical nomenclature which would result from the application of the present rules unaltered. That

no very serious effects have yet appeared is due entirely to the fact that paleobotanists, recognizing the inevitable consequences, have almost unanimously, if tacitly, refused to conform to the rules in these respects. In order to ensure the greatest possible consistency in the definition and naming of the necessary new „combination genera” and to hasten the introduction of a stable nomenclature we propose that the *permanent executive subcommittee for paleobotanical nomenclature* (compare new Art. „73 a”), publish a list of names for those „combination genera” which appear most necessary in the light of our present knowledge, together with the definitions required to make the new names legal. The subcommittee should then be quoted as the author (Pb. E. Sc., or some similar abbreviation).

XI. Section 12. REJECTION OF NAMES.

Art. 62.

Remark.

The difficulties and confusions possibly indicated in this article will be largely removed by the introduction of organ and combination genera.

Art. 64.

Remark.

Difficulties of this kind arise in paleobotany in cases where organs of different kind (e.g., leaves and seeds) are erroneously believed to have formed parts of the same plant and a new species or a new monotypic genus is established on characters derived from both organs. (Compare *note* to new Art. „57 b”).

Art. 73. After this add a new article („73 a”).

A *permanent international sub-committee* of three members for *paleobotanical nomenclature* is established.

This sub-committee shall take over, in respect to fossil plants, the functions assigned in Art. 73 to the permanent International Executive Committee and report to that committee in the same cases where the latter reports to the Congress. In consideration of the many special problems peculiar to paleobotanical nomenclature and the fact that many geologists actually engaged in systematic paleobotanical work are not sufficiently acquainted with the rules of botanical nomenclature, it is further empowered to:

a) issue and publish recommendations applicable only to fossil plants, provided that they are consistent with the Rules, these recommendations to be regarded as provisional and to be, after trial, submitted — by way of the International Executive Committee — to the Congress for sanction;

b) publish explanatory remarks and examples to elucidate the application of the Rules to fossil plants and generally promote the distribution of knowledge of the Rules and the general compliance with these Rules also in works of a prevailing geological character.

Remark.

The number of members ought to be as small as possible, If necessary the number could be made five, but certainly not more.

Appendix III a. Nomina generica conservanda.

b. Nomina generica conservanda plantarum fossilium.

Appendix VII. Paleobotanical institutions must be expressly added; many institutions where paleobotanical work is being carried on and where collections of fossil plants are kept are nominally geological.

Remarks and objections on these proposals may be sent to:

Prof. Dr. W. J. JONGMANS,
Recorder Section Paleobotany,
Geerstraat 85a
Heerlen (L.)
The Netherlands.

