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Evolution of the Proposals of Taxonomical Categories for the Classification of Cultivated Plants

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the subject than the earlier author. The case of *Polystachya luteola* (Sw.) Hook., discussed by Summerhayes and Bullock in the article immediately following that of Furtado, provides an example.

When establishing the genus *Polystachya*, Hooker made the combination *Polystachya luteola*, based on *Cranichis luteola* Sw. (1806), and (following Swartz) cited as synonym *Epidendrum minutum* Aublet (1775). Furthermore, Swartz had also published another name, *Dendrobium polystachyon* (1800), with citation of *Epidendrum minutum* as synonym. According to Summerhayes and Bullock, current taxonomic judgement confirms that all these names are synonymous. According to the rule of priority, the correct specific epithet for the species is thus *minuta*, and the genus which today is considered appropriate is *Polystachya*. The combination *Polystachya minuta* (Sw.) was however not made until 1903, and in the meantime this binomial had been used for another species. Another name was therefore necessary. The next epithet in order of priority, *polystachyon*, gives a tautonym when combined with *Polystachya*, and is therefore unusable. Thus we come again to *Polystachya luteola*, and this is rejected under art. 64-1. The next available name, considered to be the correct one by Summerhayes and Bullock, is *Polystachya extinctoria* Rehb. f. (1863). Reichenbach published this name with citation of *Cranichis luteola* Sw., with a query (and no comment), as a synonym. Thus we have to pass over Hooker's name, which he gave with the knowledge that an earlier name was available, and use Reichenbach's name, which he gave without that knowledge. This does not seem a very good reason for preferring Reichenbach. The rational solution would seem to be to use Hooker's name, thereby saving a great deal of trouble for all concerned.

So far as I can see, the sole use of art. 64-1 is to avoid the necessity of making a taxonomic judgement in troublesome cases. That such cases exist, I have no doubt; but surely some other method of dealing with them is possible, in place of the wholesale method of the present rule, which outlaws good names with bad and has been responsible for quite needless changes of names.

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## EVOLUTION OF THE PROPOSALS OF TAXONOMICAL CATEGORIES FOR THE CLASSIFICATION OF CULTIVATED PLANTS

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In a short time it will be just a hundred years since the first proposal appeared in the botanical world to designate the plants which originated in cultivation in other ways than those used for the wild ones. This proposal was contained in the letter of the French botanist Alphonse De Candolle (the son) of 1862; it was read at the International Horticultural Congress (further only IHC) of Brussels in 1864 (compare Bull. Congrès Int. Hort. Bruxelles 1864, p. 170. Gand 1864). De Candolle suggested that for the horticultural varieties (sorts) and crosses it should be obligatory to use exclusively the non-Latin, "fancy" names, i.e. so called vernacular or fashionable names derived from a modern language — now also commercial names, pleasing names with a commercially attractive form — so that the names of cultivated plants differ markedly from the Latin scientific names of species and varieties included in systematic botany, thus avoiding mistakes, confusions, and indistinctnesses.

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Since that time the question of the suitable designation of plants originating in cultivation has often been discussed at both International Horticultural and International Botanical Congresses. In the draft of the first International Code of Botanical Nomenclature (further only ICBN) elaborated by De Candolle himself (Lois de la nomenclature botanique; so called "Paris rules"), and adopted by the International Botanical Congress (further only IBC) of Paris in 1867, Article 40 deals with the nomenclature of cultivated plants, especially those of garden origin: "Dans les plantes cultivées, les semis, les méteils d'origine obscure et les *sports*, reçoivent des noms de fantaisie, en langue vulgaire, aussi différents que possible des noms latins d'espèces ou de variétés. Quand on peut les rattacher à une espèce, à une sous-espèce ou une variété botanique, on l'indique par la succession des noms (*Pelargonium zonale* *Mistress-Pollock*)". Compare J. Briquet: Texte synoptique des documents destinés à servir de base aux débats du Congrès international de nomenclature botanique de Vienne 1905. Berlin 1905, p. 67. The text of Article 40, unchanged in the main, constitutes Article 30 of both the ICBN adopted by the IBC of Vienna in 1905 (so called "Viennese Code" from 1906), and its 2nd edition after the Third IBC of Brussels in 1910 (so called "Brussels Code" from 1912). Article 30 is formulated as follows: "Forms and half-breeds among cultivated plants should receive fancy names, in common language, as different as possible from the latin names of the species or varieties. When they can be traced back to species, a subspecies or a botanical variety this is indicated by a succession of names. Example: *Pelargonium zonale* Mrs. Pollock". Compare J. Briquet: Règles internationales de la nomenclature botanique adoptées par le Congrès international de botanique de Vienne 1905. Jena 1906, p. 24 (42 and 60) and 2. éd. mise au point d'après les décisions du Congrès international botanique de Bruxelles 1910. Jena 1912, p. 19 (39 and 59). Very similar text, somewhat abbreviated but unchanged in meaning, constitutes the Article 35 of the 3rd edition of the ICBN (so called "Cambridge Code" from 1935). The main principles of the nomenclature of garden plants compiled by the extended Committee for the Nomenclature of Cultivated Plants as a new version of the rules, were not only accepted by the IHC of London (August 1930), but also adopted by the IBC of Cambridge a month later. Into the ICBN they were appended as the Appendix VII, Nomenclature of Garden Plants. Compare J. Briquet and H. Harms: International rules of botanical nomenclature adopted by the International Botanical Congress of Cambridge 1930. Ed. 3. Jena 1935. Article 35 — p. 10 (37 and 65) and Appendix VII — p. 112-113 (114-115 and 116-117). However, special systematic categories for cultivated garden plants had not been proposed at that time.

Such a proposal appeared only in 1938 at the IHC of Berlin at which the term *cultigen* (abbrev. *c.*, or *cult.*) was adopted along with additions to and changes in the provisions for the nomenclature of garden plants. "Die Prinzipien und Regeln der botanischen Nomenklatur sollen auch für die Gartenpflanzen gelten, soweit es sich um Arten und botanische Varietäten handelt. Für die Benennung der in Gärten aus Samen als Spielarten oder Bastarde gezogenen Pflanzen durch Nichtbotaniker wird bestimmt: Der Name einer Gartenvarietät (Sorte) folgt dem Namen der Art, zu der sie gehört; er wird durch ein vorgesetztes *c.* oder *cult.* (= *cultigen*) gekennzeichnet. Beispiel: *Dianthus deltoides* *c.* Brilliant". Compare 12. Internat. Gartenbaukongress, Berlin 1938. 1, p. 449-460, 1939 (sec. R. Mansfeld: Werden und Wesen der wissenschaftlichen Pflanzenbenennung und ihrer Regelung. Verhandl. des Bot. Vereins der Provinz Brandenburg 82: 67-68, 1942, or R. Mansfeld: Die Technik der wissenschaftlichen Pflanzenbenennung. Berlin 1949, p. 88). According to G. H. M. Lawrence the term *cultigen* had already been proposed in 1918 by L. H. Bailey to differentiate cultivated plants from wild, indigenous ones. In *Gentes Herbarum* 1: 113-114, 1923 (compare Lawrence, *Baileya* 3: 181, 1955b). Bailey defines the *cultigen* as follows:

“The cultigen is a species, or its equivalent, that has appeared under domestication — the plant is cultigenous”. Later on (Manual of cultivated plants most commonly grown in the continental United States and Canada. New York 1949, p. 28) he states that the cultigen is “plant or group known only in cultivation; presumably originating under domestication; contrast with indigen”. G. H. M. Lawrence (Taxonomy of Vascular Plants. New York. 2. ed. 1955c, p. 747) uses the term in the same sense.

The term and category cultigen, or rather its abbreviation *c.* only, is used in Article 35 of the new but unofficial edition of the ICBN from 1947 prepared by the American Society of Plant Taxonomy after the session in St. Louis in 1946, prepared according to the text of the Cambridge edition but incorporating the amendments adopted by the IBC of Amsterdam in 1935. Compare W. H. Camp, H. W. Rickett, and C. A. Weatherby: International Rules of Botanical Nomenclature. Adopted and revised by the International Botanical Congress of Amsterdam 1935. Unofficial special edition, issued as a service to members of the American Society of Plant Taxonomists. *Brittonia* 6, 1: 1-120, 1947 (therefore so called “Brittonia-Rules”). 2 ed. Waltham U.S.A. 1948. Article 35 (l.c. p. 13) was formulated: “Forms and halfbreeds among cultivated plants receive fancy epithets preferably in common language, as different as possible from the Latin epithets of species or varieties. When they can be attached to a species, a subspecies, or a botanical variety, this is indicated by a succession of names. The fancy epithet will be preceded by the letter “*c.*”. Examples: *Pelargonium zonale c. Mrs. Pollock*”. In the 1947 and 1948 edition of the Code (p. 112-113), “Nomenclature of Garden Plants” is also appended as Appendix VII in the same wording as that of the 1935 Code.

The use of the category cultigen, abbrev. *c.*, was “officially” valid for only a short time. A discontent with the insufficiency of the Code provoked the drawing up of a new text. W. H. Camp prepared it in substance on the basis of the proposals of specialists from both Europe and America. It was discussed and adopted by the Committee for Nomenclature of Cultivated Plants in 1950 at the IBC of Stockholm (“Stockholm Committee”), and by the International Committee for Horticultural Nomenclature and Registration in 1952 at the IHC of London (“London Committee”). The editorial committee consisting of W. H. Camp, J. S. L. Gilmour, and W. T. Stearn produced the definitive arrangement of the text. In the new Code the category cultigen has been substituted by the term and category *cultivar*, abbrev. *cv.*, which at the same time replaces the hitherto commonly used term “cultivated variety”, “cultural variety”, and all its equivalents in different languages.

According to Lawrence (Baileya 1953 l.c.) as early as 1918 L. H. Bailey proposed the term *cultivar* for the designation of varieties of plants originated in cultivation, to differentiate them from botanical varieties of wild plants. Later on (compare *Gentes Herbarum* l.c. sec. Lawrence, Baileya 1955b l.c.) Bailey defined *cultivar* as follows: “I now propose another” (i.e. in addition to the term *cultigen*) “name, *cultivar*, for a botanical variety, or for a race subordinate to species, that has originated under cultivation; it is not necessarily, however, referable to a recognized botanical species. It is essentially the equivalent of the botanical variety except in respect to its origin”. In 1949 Bailey (l.c., p. 28) defined *cultivar* as “a variety or race that has originated and persisted under cultivation, not necessarily referable to a botanical species”. See also Lawrence (1955c, l.c.).

By both the Stockholm (1950) and London (1952) Congresses the new category *convarietas*, abbrev. *conv.*, was adopted. (First used even in 1949 by I. Grebenščíkov: *Notulae systematicae. Index Seminum, Gatersleben* 1949, p. 42 and 44, for designation of a group of related cultivars.) A proposal for a new International Code for Nomenclature of Cultivated Plants was published in 1952 as the Appendix III of the ICBN. Compare J. Lanjou: International Code of Botanical Nomenclature

adopted by the Seventh International Botanical Congress Stockholm 1950. *Regnum vegetabile*, vol. 3, Utrecht 1952 (so called "Stockholm Code") p. 53-63 and 204-214. Appendix III. Proposed International Code of Nomenclature for Cultivated Plants (further only ICNCP), Article C. 5(3) and Note, and Article C. 30(e). After the discussion at the IHC of London the ICNCP was published first in the *Journal of the Royal Horticultural Society*, London 1952, p. 160-172, and then (1953) also separately (edited by W. T. Stearn). The categories cultivar (cv.) and convarietas (conv.), later often *convar.*, are up to the present the only internationally adopted categories for the systematic placing of cultivated plants. Compare the ICNCP. London 1953. Article C. 3(III) — cultivar, abbrev. cv., Article C. 4 and Article C. 29(b) — convarietas, abbrev. conv., or the ICNCP. Utrecht 1958, *Regnum vegetabile*, vol. 10. Article 5 and Note, and Article 10, and Article 14. This recent edition of the ICNCP sets out the regulations for the nomenclature of all cultivated plants (in agriculture, forestry, and horticulture), since it was prepared by the International Commission for the Nomenclature of Cultivated Plants, established at the International Union of Biological Sciences, and represented by specialists of all three branches in approximately equal proportions.

As early as in 1953, however, I. Grebenščík (Die Entwicklung der Melonen-systematik. *Die Kulturpflanze* 1: 132) and R. Mansfeld (Zur allgemeinen Systematik der Kulturpflanzen. *Ibid.* p. 155), at the same time, pointed out the insufficiency of only two categories, cultivar and convariety, for the systematic expression of the variability of cultivated plants. The use of the categories usual for the classification of wild plants is not suitable for these cases. Both authors, Grebenščík (*l.c.*, p. 132-133), but Mansfeld (*l.c.*) first of all, introduced other new categories for the systematics of cultivated plants. According to Grebenščík the category convarietas is suitable in the rank between subspecies and varietas, in Mansfeld's conception between subspecioïd and provarietas for a group of related provarietates.

But even in 1948 the Soviet specialists in the systematics of cultivated plants, E. N. Sinskaja, S. V. Juzepčuk, and K. I. Pangalo advanced in separate communications (compare *Bot. Zurn.* 33: 148-155) proposals for a series of new classification categories for cultivated plants. P. M. Zukovskij (Sovremennoje sostojanije problemy proischoždenija kulturnych rastenij. *Bot. Zurn.* 42: 1597, 1957) suggested that the taxa within a species — subspecies, convarietas (a group of similar varieties), varietas, sortotype (conculata), and sort (cultivar) — were at that time acceptable for cultivated plants. A list of the terms for categories according to their taxonomic rank, both those internationally adopted and those currently proposed, with their abbreviations, authors, and the year of their publication has been compiled by V. Jirásek (*Taxonomische Kategorien der Kulturpflanzen. Index Seminum etc. Horti Botanici Universitatis Carolinae Pragensis.* Praga 1958, p. 13). He has extended the number of the fundamental categories and of their respective subcategories, and proposed, at the same time, a collective term taxoid (abbrev. taxd., plur. taxoides) for all classification categories of cultivated plants. Cultivar and conculata, as the fundamental categories for cultivated plants, their equivalents and nomenclature of their epithets were also mentioned by V. Jirásek (Cultivar and Conculata — the Fundamental Categories for the Classification of Cultivated Plants. *Delectus Seminum etc. Hortus Botanicus Universitatis Carolinae Pragensis.* Praga 1959, p. 6-12).

The terms for the categories existing in literature on the systematics of cultivated plants (with the name of the author or originator, the year of publication, the abbreviation of the term, and a brief definition, with notes and synonyms where appropriate are listed in the following glossary. Although it was meant as the first attempt to gather at least the fundamental terms which have been proposed and used from the time of the "Lois De Candolle" till now, the enumeration of the terms of categories

for the systematic classification of cultivated plants, especially those proposed during the last twelve years, is not complete. There are missing, for example, some of the terms of Sinskaja (1948), namely isoreagent, ecoelement, subecotype, cline, climatype, geospecies, ecospecies, and coenospecies, about which the author herself wrote (l.c. p. 149) that they are not taxonomic units "sui generis" but only suitable subsidiary terms, the use of which gives precision and depth to the systematics of both cultivated and wild plants. Similarly there are not registered so called special categories (ICNCP 1953, Article C. 29), namely grex hybrida, abbrev. gh., linea, abbrev. ln., linea hybrida, abbrev. lh., clone, abbrev. cl., and apomixis, abbrev. ap. except however, convarietas, abbrev. conv., because the ICNCP 1958, Article 11, designates them as only kinds of cultivars (varieties). In addition, also, they designate to a greater or less extent characteristics of the origin of a plant. The names of hybrids (ibid., Article 38-45) are governed in substance by the respective Articles of the ICBN 1956. Compare J. Lanjouw: International Code of Botanical Nomenclature adopted by the Eighth International Botanical Congress, Paris, July 1954. Utrecht 1956, Article 40, and Appendix I. Article H 1 to H 5 (so called "Paris Code"). On the other hand the glossary contains some terms of a more common collective sense, and also the terms proposed by R. Mansfeld (1958) for the designation of "chemical" taxons, since the author does not stress their use for wild plants exclusively. The author of the glossary would be grateful for all suggestions which may contribute to its completeness and to giving precision to individual items.

### Glossary

- a e q u i f o r m a** Mansfeld (1958), see isoforma
- a e q u i s p e c i e s** Mansfeld (1958), see isospecies
- a e q u i v a r i e t a s** Mansfeld (1958), see isovarietas
- a g r o t y p u s** Sinskaja (1948), see conculta
- "b i o c h e m i c a l f o r m"** auct. (comp., for example, Tétényi 1958, p. 40), see "chemical race"
- b i o l o g i c a l r a c e** Domin (1943), see isoforma, and isovarietas
- "c h e m i c a l r a c e"** auct. (comp., for example, Tétényi 1958, p. 40) — a collective designation for infraspecific categories distinguished only by physiological-chemical characters
- c h e m o c u l t i g r e x** Tétényi (1958), abbrev. chg. — a taxoid for designation of a cultivated plant distinguished from a type only by physiological characters, in the rank between chemoconvar and chemocultivar
- c h e m o c u l t i v a r** Tétényi (1958), abbrev. chv. — a taxoid for designation of a cultivar distinguished from a type only by physiological characters
- c h e m o v a r** Tétényi (1958), abbrev. chconv. — a taxoid for designation of a "chemical race" distinguished from a type only by physiological characters. Tétényi (l.c. p. 40) proposed for "chemical races" the following ranks of categories: chemoconvar, chemocultigrex, and chemocultivar; for wild plants: chemovar (abbrev. chvar.), and chemoforma (abbrev. chf.). The epithet is formed from the name of a chemical substance distinctive of the particular "chemical race". For example, (comp. l.c. p. 41), in *Cinnamomum camphora* Sieb. subsp. *formosana* Hirota, six chemovarieties can be distinguished: chvar. borneol, chvar. campher, chvar. cineol, chvar. linalool, chvar. saphrol, and chvar. sesquiterpen, from which chvar. linalool can be divided into chf. 86%, and chf. 71%. Tétényi (l.c. p. 41) recognized in cultivated *Cinchona ledgeriana* Moens two chemo-



cultigrexes: chg. chinidin, and chg. cinchonidin. He proposed to designate “chemical races” — polyploids by the respective categories with figures “n” appending to the epithets. For example, a chemoconvar of *Achillea millefolium* L. contains two chemocultigrexes: chg. proazulen 2n, and chg. proazulen 4n. In *Taxon* 7, 2: 39-44, 1958, there are published the proposals of several authors (comp. also Mansfeld) for the terminology of special categories for plant types distinguished only by physiological characters. A negative attitude towards these proposals is advocated by W. Vent (*Taxon* 9, 2: 53-54, 1960), and justified in the following way: “Ich schlage vor, für chemisch charakterisierte Sippen keine besondere Bezeichnung einzuführen, sondern diese wie üblich nach den gültigen Regeln der internationalen botanischen Nomenklatur zu behandeln, denn es handelt sich auch bei solchen Sippen in allen Fällen um Pflanzen, die Unterschiede liegen nur in der Anwendung verschiedener Methoden. Nach der eingangs erwähnten Lage erscheint es ratsam, von einer besonderen Bezeichnung chemisch charakterisierter Taxa auch deshalb abzusehen, weil sonst leicht mit der gleichen Berechtigung auch die Forderung erhoben werden könnte, z.B. elektronenoptisch charakterisierte Taxa entsprechend besonders zu bezeichnen, was eine weitere Komplizierung unserer Nomenklatur bedeuten würde”. In accordance with the ICNCP 1958, a chemically distinguished type may be treated as a new cultivar as, according to the Article 5 “The term cultivar (variety) denotes an assemblage of cultivated individuals which are distinguished by any characters (morphological, physiological, cytological, chemical, or others) . . .” Compare also J. Lanjouw: On the Nomenclature of Chemical Strains. *Taxon* 7, 2: 43-44, 1958. The justification or redundancy of “chemotaxons” and “chemotaxoids” will certainly be discussed in future

- c o n c u l t a Zukovskij (1957), abbrev. conc. — a taxoid for the designation of a group of cultivars (by Pangalo, 1948, also parasort, see this item) related by morphological (physiological, ecological, geographical, or economical) characters, cultivated sometimes together. Syn. agrotypus, convarietas — sec. ICNCP 1953, Article C. 29(b), cultigrex, group (and synonyms), nidus, sortotypus
- c o n g r e g a t i o Flaksberger (1935) — a category which has been used by the author for the pointing out of fundamental groups of both wild and cultivated species of wheats (*Triticum* L.) conforming in chromosome number (*Diploidea*, *Tetraploidea*, *Hexaploidea*)
- c o n s p e c i e s auct., abbrev. consp. — a category for the designation of related and crossing species of wild origin (species), or originating in cultivation (specioid), or of both types. For example, *Medicago sativa* L. s.l. (Sinskaja, 1950, p. 28, and 46), or *Cucumis melo* L. s.l. (Greibenščikov, 1953, p. 134)
- c o n v a r i e t a s Grebenščikov (1949), abbrev. convar. — a taxoid for the designation of a group of related provarietates in the rank between subspecioid, or cultiplex, and provarietas. R. Mansfeld (1953), V. Jirásek (1958), and others used the abbreviated term convar (abbrev. conv.), like cultivar; but the use of the full wording is recommended to accord with varietas, abbrev. var. According to the ICNCP 1953, Article C. 29(b), convarietas, abbrev. conv., is “a group of cultivars within a variable species or interspecific hybrid possessing common features of importance to cultivators”. The ICNCP 1958, Article 14, places convarietas among so called “Supplementary Categories” which only have botanical characters and are therefore governed by the ICBN. Syn. cyclus (Sinskaja 1948)
- c u l t i g e n Bailey (1918, or 1923), abbrev. cult., c., or cg. — a term for collective designation of plants originating and existing only in cultivation, unknown as wild plants. See cultivar

**cultigrex** auct., abbrev. cgr., see *conculta*

**cultimorpha** Semenov (1910), see *subspecioid*

**multiplex** Juzepčuk (1948) em. Jirásek (1958), abbrev. cpl. — a taxoid for the designation of a group of closely related convarietates in the rank between *subspecioid* and *convarietas*. According to Juzepčuk's original conception it is a complicated net of forms of very diverse origin (mostly hybrid) and importance; it is a *cultigen complex*, abbrev. *multiplex*; most likely an analogue of *species collectiva* of wild plants. Syn.  $\pm$  *series*

**cultitaxon** auct., see *taxoid*

**cultivar** Bailey (1918, or 1923), abbrev. cv. — the lowest fundamental taxoid for the systematic classification of cultivated plants. According to the ICNCP 1958, Article 5 "The term cultivar (variety) denotes an assemblage of cultivated individuals which are distinguished by any characters (morphological, physiological, cytological, chemical, or others) significant for the purposes of agriculture, forestry, or horticulture, and which, when reproduced (sexually or asexually), retain their distinguishing features". For comparison, some authors' definitions of the term *sort*, now the equivalent and synonym of *cultivar*, follow. K. Domin (1945, p. 215): an inheritable form of cultivated plant with insignificant morphological differences, but usually distinguished by biological (physiological) characters, and of some economical importance, containing one or several pure lines. K. I. Pangalo (1948, p. 154): an inheritably constant morphological-biological state (definiteness) originated and maintained by artificial selection and existing within the boundaries of a particular area of cultivation as a collection of sexually or vegetatively reproducing plants. R. Mansfeld (1953, p. 149): a more or less uniform population of plants cultivated for certain purpose, and therefore maintained with characteristics constant within certain limits for a considerable period. The term and category *cultivar* was adopted by the IBC of Stockholm (1950), and by the IHC of London (1952) as a substitute for the existing category *cultigen* and the term and category *variety*, *sort*, and their other equivalents at the same time. These are, for example, "cultivated variety", "horticultural variety", and "variety" as commonly used in agriculture, forestry and horticulture (comp. the ICNCP 1953, Article C. 3(III), Note), *variety* in English, "variété" in French, "variedad" in Spanish, "Sorte" in German, "sort" in the Scandinavian languages and in Russian, "ras" or "variétéit" in Dutch, "razza" [and "varietá" — completed by V. J.] in Italian, ["sorta" or "odruđa" in Czech — completed by V. J.], etc. (comp. the ICNCP 1958, Article 10), or "stamm" (comp. Lawrence, *Baileya* 3: 179, 1955b), or "Hort. form." (ibid. p. 181). The decision about the same validity of both the term *cultivar*, and its international equivalents was made by the IHC of Scheveningen with validation from 6 September 1955 onwards. Article 10, ICNCP 1958, therefore says: "Anyone is free to use the term *cultivar* or one of the equivalent terms. When the terms *variety*, *variété* and their variants are used in the sense of *cultivar*, confusion with the term *varietas* should be avoided by a suitable explanation. *Varietas* refers to a botanical category intermediate between *species* and *forma*". Lawrence (*Baileya* 3: 181, 1955b and 5: 162, 1957) pointed out the indisputable advantages of the exclusive use of the uniform term and category *cultivar* in comparison with its equivalents, especially with the ambiguous term *varietas*. The term *cultivar* is in fact an abbreviation of "*cultivarietas*"; this full wording would accord with *convarietas*, *provarietas*, *varietas*, etc. But *cultivar* has been adopted in this wording which is therefore valid and obligatory. By analogy with *cultivar*, Mansfeld (1953) and also other authors have introduced the terms *convar* and *provar*; but the full wording, *convarietas*, abbrev. *convar.*,



provarietas, abbrev. provar. (in accordance with varietas, abbrev. var.) is recommended. Cultivar (and subcultivar) is simply a taxoid of somewhat special characters because its names are mostly vernacular. Syn. cultigen, mixomorpha, sort, variety, and their equivalents,  $\pm$  subcultigen

**cultivated race** Domin (1943) — a term for the designation of a biotype of spore plants that has appeared in cultivation

**cultivated taxon** auct., see taxoid

**cyclus** Sinskaja (1948), Pangalo (1948) — a taxoid for the designation of a group of closely related types (mostly of hybrid origin), the features of which combine in a “net-like” manner, and whose relationships also are “net-like” (Sinskaja). Mansfeld mentioned such a connection of features, for example, in *Hordeum vulgare* L. s.l. (1950, p. 8-9): “Die morphologischen Varietäten zeigen in ihren Merkmalen netzförmige Verknüpfung, d.h. jede Varietät unterscheidet sich von mehreren anderen nur in einem, aber jeweils in einem anderen Merkmal. Es sind daher viele verschiedene Gruppenbildungen (bzw. Aufteilungen in Arten) möglich; alle diese Gruppen sind jedoch immer auf ein einziges Merkmal gegründet und künstlich. Die Varietäten sind sicher z.T. genetisch nicht einheitlich; dieselbe morphologische Varietät kann durch Kreuzung oder Mutation aus sehr verschiedenen anderen Varietäten entstehen . . .” Syn. convarietas. — a taxoid for the designation of a group of closely related nidus, or conculata (Pangalo). Syn. grex (Brežněv, 1958),  $\pm$  provarietas

**divisio** Pangalo (1948) — a taxoid for the designation of a group of closely related cycles. Syn.  $\pm$  convarietas

**ecotype**, see oecotypus

**ergasial** Juzepčuk (1948), see specioid

**grex** auct. soviet pro max. p., abbrev. gr. (better than g., compare below) — usually only a subsidiary unit for the classification of variability within subspecies, for example, for groups of varieties related by morphological characters (Mansfeld 1953: 154). Syn.  $\pm$  convarietas. Or for a group of closely related sortotypes, i.e. conculata (Brežněv 1958: 91-102). Syn. cyclus (Pangalo 1948),  $\pm$  provarietas. Flaksberger (1935: 55) observed that grex is not a systematic unit but a collective group, since it contains forms of different ecological-morphological, or geographical units, i.e. proles, subproles, eventually also different subspecies; then a conglomerate of very polymorphous forms. However, the forms belonging to one proles may be joined into varieties. Both Sinskaja (1948), and Pangalo (1948) recommended the exclusion of grex from the system of classification categories for the systematics of cultivated plants because its use for various concepts may result in confusion. According to the ICNCP 1953, Article C. 25(c) and (d), and the ICNCP 1958, Article 40, the term grex, abbrev. gr., should be used for collective names of cultivars of hybrid origin. Grex (1953), grex (1958), or G. (1953), g. (1958) should follow the collective designation. Compare also the ICNCP 1958, Article 42, Note 1, and Article 44. According to the Article 42 “A collective name in a modern language must be distinguished typographically from the generic name to which it is attached, usually by printing the generic name in italics”. Lawrence (Baileya 5: 165, 1957) mentioned difficulties and confusions from indistinct typographical distinction of the names applied to grex (or also to cultivar)

**group** (Gruppe, groupe, gruppia, skupina, etc.) auct. — according to the ICNCP 1958, Article 13 “Within a species or interspecific hybrid which includes many cultivars (varieties), assemblages of similar cultivars (varieties) may be designated as groups”. Syn. conculata, convarietas — sec. ICNCP 1953, Article C. 29(b)

**isoforma** Mansfeld (1958), abbrev. isof. — a category for the designation of a form distinguished from a type only by physiological characters, but conformable with it morphologically. A morphological (taxonomical) form may be divided into several isoforms, distinguished by physiological characters but conformable taxonomically (morphologically). Syn. *aquiforma*, biological race

**isospecies** Mansfeld (1958), abbrev. isosp. — a category for the designation of a species distinguished from a type only by physiological characters. The species may be divided into several isospecies, distinguished by physiological characters but conformable taxonomically. Syn. *aquispecies*

**isovarietas** Mansfeld (1958), abbrev. isovar. — a category for the designation of a variety distinguished from a type only by physiological characters. The varietas may be divided into several isovarietates, distinguished only by physiological characters but conformable taxonomically. Syn. *aquivarietas*, biological race. Mansfeld (l.c. p. 43), for example, proposed to divide a morphologically (taxonomically) characterized varietas into a number of isovarieties, distinguished by physiological characters (similarly in species, forms). Then a var. *n* would be divided into isovar. *n*, isovar. *n*<sub>1</sub>, isovar. *n*<sub>2</sub>, etc. “wobei *n*, *n*<sub>1</sub>, . . . irgendwelche Namen bedeuten”. “Der Weg entspricht dem derzeit in den Regeln für die Behandlung morphologischer Sippen, die weiter aufgliedbar sind, vorgeschriebenen”. “Im übrigen müssten die physiologischen Sippen behandelt werden, also mit Namen belegt und beschrieben werden. Eine gewisse Schwierigkeit bildet dabei die Frage der Typisierung, d.h. die Frage der eindeutigen Bindung des Namens an die Sippe. Bei morphologischen Sippen geschieht diese Bindung letzten Endes immer durch die Bezugnahme auf bestimmtes konserviertes Material, was z.B. bei manchen Kryptogamen auch nicht allgemein möglich ist. Bei den physiologischen Sippen müsste wohl dafür die genaue Festlegung bestimmter Testverfahren eintreten”.

**mixomorpha** auct., abbrev. mx. — a category for the designation of forms of chimeras, distinguished by morphological or histological characters. The names of the mixomorphas are vernacular or Latin, and follow after the names of the chimeras like trinomes. Compare the ICNCP 1953, Article C. 32(d). But according to the ICNCP 1958, Article 50, a mixomorphous form of chimera is designated only as a distinct cultivar. Syn. *cultivar*

**nidus** Pangalo (1948), see *conculta*

**oecotypus** auct., abbrev. oecot. — a term for the designation of a group of biotypes inhabiting a certain biotope, and distinguished within its own grouping by a definite combination of features and qualities. Sinskaja (1948) treats the oecotype as a unit both for the systematics within a species and for the phylogenetical ecology of cultivated plants; but it does not become a constituent of fundamental taxonomical nomenclature (like species and subspecies do). However, the descriptions of all ecotypes forming a species should be added. Flaksberger (1935: 42) considered the term ecotype as only defining a concept, because it may be used equally for a species, variety, or sort, i.e. for different classification categories if they represent a conformable ecological type. Sinskaja (1948) recognized *oecotypus localis* (the local ecotype), and *oecotypus regionalis* (the regional ecotype, or *geoecotypus*, *geoecotype*). According to the author the only *geoecotypes* that exist in cultivated plant, are those the forming of which was influenced mostly by geographical isolation. Both kinds of ecotypes are distinguished only by biological and physiological characters; the morphological differences can be hardly discerned. The local ecotypes are named according to the characters of their localities, for example, *oecotypus arenarius*, *oecotypus salignus*;

the regional ecotypes are designated geographically, for example, *oecotypus borealis*, *oecotypus jemenensis*, etc. Syn. *subspecioid*

**parasort** Pangalo (1948) — a term for the designation of an inheritably constant morphological-biological state (definiteness) originating naturally, and existing as a collection of generations of the system of cultivated populations, or in a pure state as a collective pattern. Variegated populations without any delimitation are divided into composite forms, parasorts. The parasort is in substance a pure line of single origin

**physiological varietas** auct. (compare Tétényi 1958, p. 40), see “chemical race”

**proles** auct. soviet. pro max. p., abbrev. prol. — a category for the designation of a group of varieties conformable from the ecological-morphological, and often also the geographical, point of view. Soviet botanists use it for the systematic classification of cultivated plants in the rank between subspecies and *varietas*. Compare *Kulturnaja Flora SSSR, 1935-1958*. Both Sinskaja (1948) and Pangalo (1948) recommended the exclusion of *proles* from the system of classification categories in the systematics of cultivated plants, for the same reason as that of *grex*; similarly also *varietas* (Sinskaja, 1948; Pangalo, 1948), *subvarietas* (Sinskaja, 1948), *subspecies* and *forma* (Pangalo, 1948). Syn. *race*,  $\pm$  *convarietas*

**provarietas** Mansfeld (1953), abbrev. provar. — a taxoid of a systematic value of *varietas* in wild plants. Mansfeld (1953: 155) introduced the abbreviated term *provar*; according to him so also did Rothmaler (1955: 201), Dostál (1957: 250), Jirásek (1958: 13), and others. The full wording to accord with *varietas*, abbrev. *var.*, is recommended

**race** auct., see *proles*

**series** auct. soviet pro max. p. — a category for the designation of a group of closely related *proles* (Flaksberger 1939). Syn.  $\pm$  *cultiplex*,  $\pm$  *subspecioid*. Usually a category for the designation of a group of related species forming a *conspecies* (Sinskaja 1948). According to this author it is not a static taxonomic unit characterized by a definite uniformity, but it shows the direction of evolution. Then species, subspecies, ecotypes, and even *sortotypes* may be joined into *series*. It may be used in systematics within a species of both cultivated and wild plants. Compare, for example, *Medicago sativa* L. s.l. (Sinskaja 1950, p. 46-48)

**sort** auct., see *cultivar*

**sortotype**, see *sortotypus*

**sortotypus** auct. soviet., see *conculta*

**species** auct. soviet. pro max. p., abbrev. sp. — a fundamental taxon for the systematic classification of both cultivated and wild plants. Syn. *specioid*

**specioid** Mansfeld (1953), abbrev. spd. — a taxoid  $\pm$  of the systematic rank of species in wild plants containing only cultivated forms. According to Mansfeld (*Zur allgemeinen Systematik der Kulturpflanzen II. Die Kulturpflanze 2: 141-142, 1954*) the *specioid* may be used: when a cultivated taxon is quite isolated, without any transition to wild forms; when a cultivated plant originated by the union of several wild species; when the differences between a cultivated plant and the original wild one are based on distinct “selective” features, and the transitive forms do not exist, or are not possible at all; in amphidiploids and allopolyploids; in polyploids only in the case where morphological differences from the original forms can be easily recognized. Syn. *ergasial*

- subconculata** Jirásek (1958), abbrev. subconc. — a subcategory of conculata
- subconvarietas** Jirásek (1958), abbrev. subconvar. — a subcategory of convarietas. Jirásek (1958: 13) used the abbreviated term subconvar, abbrev. subconv.; however, the full wording to accord with varietas, abbrev. var., and subvarietas, abbrev. subvar., is recommended
- subcultigen** Dostál (1956) ex Jirásek, abbrev. scg., see cultivar, and subcultivar
- submultiplex** Jirásek (1958), abbrev. subcpl. — a subcategory of cultiplex
- subcultivar** Dostál (1955) ex Jirásek, abbrev. subcv. — a subcategory of cultivar. Syn.  $\pm$  subcultigen
- subcyclus** Pangalo (1948) — a subcategory of cyclus. Syn.  $\pm$  subprovarietas
- subdivisio** Pangalo (1948) — a subcategory of divisio. Syn.  $\pm$  subconvarietas
- subgrex auct. soviet. pro max. p.**, abbrev. subgr. — a subcategory of grex. Syn. subconculata,  $\pm$  subconvarietas
- subprovarietas** Jirásek (1958), abbrev. subprovar. — a subcategory of provarietas. Jirásek (1958: 13) used the abbreviated term subprovar, abbrev. subprov.; however, the full wording to accord with varietas, abbrev. var., and subvarietas, abbrev. subvar., is recommended
- subspecies** Sinskaja (1948), abbrev. subsp., more suitable than ssp. — a regional ecotype (*oecotypus regionalis*, compare *oecotypus*) distinguished by striking morphological features. Syn. subspecioid
- subspecioid** Mansfeld (1953), abbrev. subspd., more suitable than sspd. — a subcategory of specioid; a taxoid of a systematic rank more or less equivalent to subspecies in wild plants; it may be not distinguished by its area of occurrence. According to Mansfeld (1953: 154) it may be used in the case when the original wild type of a cultivated plant is known, and their relationship has been ascertained by the existence of transitional forms; then wild and cultivated populations should be distinguished in a united species (with the name following the rule of priority according to the code of nomenclature) as a subspecies and subspecioid. Syn. cultimorpha, series
- taxoid** Jirásek (1958), abbrev. taxd., plur. taxoides — a collective designation for individual taxonomic categories for the systematic classification of cultivated plants. Since the term taxon (plur. taxa) is used as a collective designation for individual taxonomic categories both in systematic botany and in systematic zoology, the distinguishing of *phytotaxa* (abbrev. phytotax., sing. phytotaxon) for phytotaxonomy, and *zootaxa* (abbrev. zootax., sing. zootaxon) for zootaxonomy in the complex taxa is advisable. The term taxoid may be used analogically for the designation of categories for the systematic classification of all biological types originating and existing only in cultivation and unknown in wild state, i.e. of cultivated plants and domesticated animals (their breeds, races, forms, etc.). Then *phytotaxoid* (abbrev. phytotaxd., plur. phytotaxoides), and *zootaxoid* (abbrev. zootaxd., plur. zootaxoides) may be distinguished. In view of the fact that on an international basis only the ICNCP has been elaborated, while in systematic zoology the same rules for nomenclature exist for the names of both free-living and domesticated animals, the use of the term *taxoid*, abbrev. taxd., plur. taxoides as a collective term for taxa of cultivated plants, will suffice. Syn. cultitaxon, cultivated taxon

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## REFERENCES

### TO DATES OF ISSUE AND OTHER BIBLIOGRAPHIC DATA ON ENTRIES IN THE MERRILL-WALKER: "BIBLIOGRAPHY OF EASTERN ASIATIC BOTANY" 1938

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While gathering references for the just published Supplement to the Merrill-Walker Bibliography, references were noted which dealt with the exact dates of issue of important works listed in that original volume. A few of these references have been listed in the Supplement and can be located through the index heading on p. 435 "Dates of publication and other bibliographic data". Many other references are given