

## NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM

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THE purpose of this paper is to publish a number of new combinations, new species, new varieties and forms, as well as to record various observations which have presented themselves in the course of a systematic rearrangement of the herbarium of the Arnold Arboretum and while working on a manual of cultivated trees and shrubs. Particularly the application of the International Rules of nomenclature to the material preserved in our herbarium has made new combinations necessary, and a few words therefore may be said of the principles guiding these nomenclatorial changes.

The interpretation of certain articles of the International Rules has been always subject to a diversity of opinion, due chiefly to more or less vagueness in the wording of these articles and to the introduction into the rules of the type method, to which nearly all American botanists now adhere and which apparently is gaining more and more foothold abroad, as shown by the additional recommendation, XVIIIbis, in the revised code which reads: "When publishing names of new groups to indicate carefully the subdivision which is regarded as the type of the group: the typical genus in a family, the typical species in a genus, the typical variety or specimen in a species." One of the most important consequences of the acceptance of the type method is a different attitude in regard to articles 45 and 47 dealing with the division of groups.

It is not the place here to enter into a discussion as to how to determine the type of genera and species and it is, moreover, hardly possible to formulate general rules for the determination of types, as each case must be considered and judged on its own merits, but it may safely be stated that the number of cases where one cannot reach a conclusive decision is comparatively small. The difficulty lies chiefly with those who consider a group to be a conception, that is, a genus a group of species, and a species a group of individuals or minor forms joined together by common characters and circumscribed by a description, instead of taking the position that the groups or individuals are assembled around a group or an individual which is considered the typical representative; however much or however little a group is changed by additions or subtractions, it always keeps the same name with the citation of its original author as long as it contains the typical form. Those who view a group as a conception are easily led to abandon a specific name on the plea that it is composed of different elements, if it contains forms which according to our present point of view represent different species, or in the case of a genus to resort to counting the number of species and leaving the name with the largest number. There is, no doubt, great difficulty in determining the generic type in some of the old Linnaean genera like *Sorbus*, *Crataegus*, *Prunus*, and for such cases the doctrine of



residues may perhaps be put into practice. The method of taking the first species in a genus or the first citation or synonym in a species is an artificial makeshift and not to be recommended. In genera to make the selection of the type dependent, as recommended in the examples under art. 45, on subsequent publications where the original extent and circumscription of the genus often is considerably altered, is certainly against the principle of priority, and as it thus violates one of the fundamental principles of the Code, we may consider ourselves justified in disregarding this recommendation. There will be, of course, cases when the type method will result in displacing generally accepted names, or cause considerable inconvenience, but this is unavoidable, if one follows consistently any set of rules. In the case of a generic name it may be saved by including it under the nomina conservanda, and in a case like *Ulmus campestris* the name may be rejected by taking recourse to art. 51, 4 of the rules.

Another source of different opinions is article 50, arising chiefly from the fact that no distinction is made between valid names and valid taxonomic groups, that is between nomenclatorial and taxonomic validity. The wording of the rule: "No one is authorized to reject, change or modify a name . . . because of the existence of an earlier homonym which is universally regarded as non-valid," is unfortunate. The phrase "universally regarded as non-valid" seems contradictory in itself, for a name is either valid or non-valid, depending on whether it is formed according to the rules or not, and it cannot be made so by general consent. This becomes clear by the revised article 56 which reads in part: "By valid name is implied a name and especially a combination of names formed in accordance with the rules of nomenclature." The strict adherence to this ruling will exclude a considerable number of homonyms which otherwise tend to make nomenclature unstable. As names that have become synonyms by change of generic or specific limitations may be revived at any time by another change in the taxonomic valuation of genera or species, I have termed non-valid names unconditional synonyms, and synonyms for taxonomic reasons conditional synonyms (see *Rhodora* xvii. 61, footnote). As an example, *Picea canadensis* (Mill.) Britton, Sterns & Poggenburg, may be cited. This name cannot stand on account of the older *P. canadensis* (L.) Link which is the correct name of the Hemlock Spruce under the genus *Picea*. Even if *Tsuga* is now recognized as a distinct genus by almost all botanists and therefore *Picea canadensis* Link referred to *Tsuga canadensis* as a synonym, this should not make any difference, since at any time botanists may unite *Picea* and *Tsuga* again and thereby cause *P. canadensis* Link to be revived. A similar case is *Malus floribunda* Sieb., which if transferred to *Pyrus* should be changed to *P. pulcherrima* Ascherson & Graebner and not be called *P. floribunda* Voss, on account of the older homonym *P. floribunda* Lindley, even though according to the author's view that species belongs to *Sorbus* or *Aronia*, but as there are botanists who unite *Pyrus*, *Malus*, *Sorbus* and *Aronia*, and others who unite *Malus* and *Pyrus* and keep *Sorbus* distinct, *Pyrus floribunda* Voss would under certain generic limitations keep its



name, while under different generic limitations the name had to be changed to *P. pulcherrima*, if no distinction is made between taxonomic and nomenclatorial synonyms. As an example concerning specific names within the same genus, *Rosa microphylla* Roxburgh (1820), may be quoted; this name cannot be maintained, as there is an older *R. microphylla* Desfontaines (1798) which, though generally referred as a synonym to *R. sempervirens* L., does not represent the type of that species and therefore may be revived by an author favoring narrower specific limits. On the other hand, a name like *Quercus lanuginosa* Thuillier (1799) is to be considered valid, though there is an older *Q. lanuginosa* Lamarck (1778) which, however, is not valid, as it is a nomenclatorial synonym of *Q. Cerris* L. (1753) being based on that species.

One of the most difficult problems is the nomenclature of varieties and other subdivisions of species. Many botanists consider the different grades of subdivision of species as subject to the rules governing the change of rank, while others preserve even the original author citation when changing a variety to a form or vice versa. One of the chief objections against the former practice is the lack of restriction placed on the number of subdivisions, for according to art. 12 one is allowed to intercalate as many supplementary groups as one sees fit, and the absence in many cases of the exact designation of the nature of the different grades, which often are preceded only by letters, numerals or typographical signs, or are joined directly to the specific name (so-called trinomials). Even if such terms as variety or form are used, they are frequently employed in a vague sense and may have different value in different publications. It is difficult to see how we can apply to subdivisions whose grade is not clearly defined the strict rules governing change of rank without introducing many unnecessary changes on account of different opinions on the valuation of certain names. The possibility also is thereby given to change at will almost any name of a subdivision by changing the designation of the grade, e. g. by calling a form a *lusus*, a subvariety a form, a variety a subspecies; though such changes are against the recommendations, they are not against the rules, and once made, whether intentionally or inadvertently, they cannot be revoked.

To make the nomenclature of varieties as stable and simple as possible, it seems best to consider as groups of different rank only those restricted to definite numbers, that is the main groups as enumerated in article 10 and their subdivisions as given in article 11, counting the subdivisions of each main group as one unit, that is as one rank, while the different kinds of subdivisions as admitted by art. 12 which are of an indefinite number, may be considered grades or degrees of subdivision. Regarding the question whether the different subdivisions of species should be considered ranks, it seems significant that among the numerous examples illustrating change of rank, none is given which illustrates the change of any grade of subdivision to another grade of subdivision of the same species. It also is to be noted that apparently subdivisions of a genus, as subgenus and section, are not considered as constituting different ranks, as shown by the first example



under art. 48: "The subgenus *Alfredia* Less. of the genus *Rhaponticum* keeps its name when placed in the genus *Carduus*: *Carduus* sect. *Alfredia* Benth. & Hook. f."

I am therefore inclined to maintain in every case the oldest name regardless of change of grade or so-called rank. The name of the author, however, should be changed with a change in the grade, if the nature of the grade is clearly defined in both instances; if the original author failed to designate the grade, the fixation of the grade is an emendation and the name of the original author should be kept. If a combination is used as a trinomial the author of the original combination should be quoted regardless of any later change of grade.

To designate a certain subdivision of a species it is only necessary to add the name of this subdivision to the binomial, omitting the names of any higher grades which may have been placed between this particular subdivision and the specific name. A combination of three names should always be sufficient to designate any group below the species. This, of course, does not apply to exact taxonomic work where names and combinations should be cited exactly as published by their author.

As to precise citation, I want to draw attention to the fact, that in most publications names published as synonyms are cited as if published as valid names; it seems advisable to add in such cases always after the citation the words "as a synonym" or "pro synonym." and in exact citation also the name of the group under which the name in question is placed as a synonym. Likewise should the fact that a name has been published without description or reference to a previous description, and therefore not valid, be brought out by the addition of the words "nomen" or "nomen nudum," or of "nomen seminudum," if an insufficient reference, perhaps a reference to an illustration without description, is given.

When it seems desirable to abbreviate citations as much as possible, one may restrict the author citation in cases where two authors (the author of the manuscript name and the publishing author) are given to the name of the publishing author; this is particularly important in names cited as "Hort."; e. g. *Gesnera Donklarii* Hort. apud Hook. should be abbreviated *G. Donklarii* Hook. The citation "Hort." alone is almost meaningless, as it not infrequently happens that the same name has been used for different plants in different gardens and as this citation does not give the slightest hint when and where such a name may have started. The author who first publishes such a name with a description makes the name valid and is really the author of the name from a nomenclatorial point of view.

At this institution we have to deal to a great extent with forms of cultivated plants and their nomenclature presents some additional difficulties which cannot be entirely solved with the help of the International Rules of botanical nomenclature. We have therefore to take into consideration the rules accepted by the International Congress of Horticulture at Brussels in 1910. These rules were originally published in Bull. Soc. Bot. Belg. XLVII. 419-424, preceded by a detailed preliminary report (pp. 363-419); an Eng-



lish version preceded by the preliminary report of the Royal Hort. Society only appeared later in Jour. Roy. Hort. Soc. xxxvii. 149-151 from which we quote.

According to article i. horticultural nomenclature is based upon the rules of botanical nomenclature as adopted by the International Congress of Botany held at Vienna in 1905, with some modifications, however, which concern the nomenclature of varieties and hybrids.

Art. ii. dealing with the naming of horticultural varieties reads: "It is necessary in naming horticultural varieties of species and simple forms to employ the complete names of the species with the name of the author. The employment of Latin in naming horticultural varieties is authorized only when the character of the plants is expressed, e. g., nanus, fastigiatus, etc. The use of Latin proper names for such varieties is proscribed.

"The names of horticultural varieties must always be written in Roman characters. [E. g. *Alyssum maritimum compactum*, *Pelargonium zonale* 'Mrs. Pollock.']"

Before accepting the ruling of this article we have to answer the question what constitutes a horticultural variety or form, as neither the rules of botanical nor of horticultural nomenclature give a definition of this term.

Can we really make a distinction between a horticultural and a botanical form? Is there any inherent difference between a mutation which has sprung up in the field or forest and has by a lucky chance survived, and a mutation which has sprung up in the seed-bed of the nursery and saved by man's interference? A large number of so-called garden forms have originated spontaneously as is well known and afterwards transferred to the garden and propagated. Is e.g. *Ilex opaca* f. *xanthocarpa* Rehder, because it was found wild and named before it was introduced into cultivation, a botanical form, and *Ilex Aquifolium* f. *chrysocarpa* Zabel a horticultural form, because it originated in cultivation and was named from a cultivated plant? I think one can but answer no.

It therefore appears that the difference is not in the plant, but in the name or in the rules governing the name, whether one applies the name from a botanical point of view considering the form a group of similar individuals whose taxonomic limits one can modify without change of name, while a horticultural form applies to an individual or its equivalent. This named individual is usually perpetuated by vegetative propagation, or if propagated by seeds only the individuals which reproduce the parent exactly are considered as belonging to the named form in question, while every slight deviation is a "rogue" which is either disregarded or destroyed, or if possessing special horticultural merits, given another name and made the starting point of a new form. It is therefore only fitting that such individuals should bear vernacular names, which may be compared to the names of human individuals, while on the other hand we are justified in treating every form which bears a name indistinguishable from a so-called botanical name, according to the rules of botanical nomenclature, that is as a group which may include besides the typical individual other closely re-



lated individuals showing slight variations but possessing the chief characters of the form in question. This is probably the idea underlying the rule that Latin names like "nanus, fastigiatus" are allowed, while proper Latin names are proscribed, because the framers of that rule, though not clearly stating it, apparently considered these Latin names to be group names.

Horticulturists therefore should use names differing in form from botanical names, if they desire to have the name stand for exactly the plant they intend to name. This agrees with the way plant breeders generally look on the named forms they distribute and the practice is well adapted for the purpose it serves and should not be interfered with. A horticultural name lapses when the plant disappears from cultivation, while a botanical name remains still valid in such a case and should be used again, if at any time a form appears answering to the description of the original form.

A name like *Thuja occidentalis* f. *aurea* Nicholson may be applied to different yellow-leaved forms differing in the shade of yellow and perhaps slightly in other characters, but a name like "Meehan's Golden" stands for an individual form and for its vegetative progeny; if this plant had been named "Meehanii" one would be justified in treating it as a botanical name and make it a synonym of *T. occidentalis aurea*, or if that latter name did not exist, make it the type of a group of yellow-leaved forms in which it would lose its individuality.

In some instances names of new horticultural forms have been published consisting of two not connected Latin words, e. g. *Chamaecyparis pisifera* var. *plumosa aurea*; this name stands for a form which is different from *C. pisifera plumosa* and also from *C. pisifera aurea*. According to the rules of botanical nomenclature a varietal name can be used only once under the same species, while according to the rules of horticultural nomenclature varietal names consisting of two or three words are allowed, though one is probably correct in assuming that this rule really is intended for names in the vulgar tongue like "Madame Casimir Perier" or "Mrs. Pollock." If we consider "plumosa aurea" a horticultural name, it can be used, but may be written *C. pisifera plumosa aurea* or *C. pisifera* "plumosa aurea" to bring out the fact by the difference in type or by the quotation marks that the varietal name is not a part of the botanical name. If, however, "plumosa aurea" is considered a botanical name, it must be changed, as it is contrary to the rules of botanical nomenclature, and a new name chosen, consisting of a single word. It seems rather doubtful if it is advisable to coin new names for all cases where the name of a horticultural variety consists of two or more words, and therefore, it is probably better to leave and use these names as they are, indicating only by the manner of writing and quoting them, that they are not part of the botanical name and that the whole name is not a combination in the nomenclatorial sense of the term.

Of the modifications concerning hybrids, the most important adopted by the Horticultural Congress is contained in art. XIII. which reads: "Bigeneric hybrids are also designated by a name and a formula. The generic name is formed by the combination of the generic names of the parents. . . . —



Multigeneric names known so far only in Orchids also receive distinct generic names according to article xiv.

The International Rules of botanical nomenclature do not favor the coining of new names for intergeneric hybrids. Art. 32 rules that the intergeneric hybrid is associated with the one of the two genera which precedes the other in alphabetical order. Against this ruling the following objections can be raised: 1° that such names give by their form, if used without their formula, not the slightest hint that the hybrid is an intergeneric hybrid, as it may as well be taken for a hybrid between two species of the same genus — 2° that it seems logical that a hybrid between two genera receives a distinct generic name, as long as a hybrid between two species of the same genus receives a distinct specific name — 3° that the insertion of an intergeneric hybrid under one of the parent genera would necessitate a change in the characters of the genus under which it is placed — 4° that the giving of new generic names to intergeneric hybrids is according to general usage, as almost every one of these hybrids has received a generic name.

A modification concerning specific names of hybrids is contained in art. viii. which reads: "The specific name of a hybrid may be expressed in Latin or in any language that is written in Roman characters." This partly contradicts art. 31. of the Rules of botanical nomenclature which reads: "Hybrids between species of the same genus or presumably so, are designated by a formula and, whenever it seems useful or necessary, by a name. . . . The name which is subject to the same rules as names of species, is distinguished . . . by the sign  $\times$  before the name." As names in the vulgar tongue are not allowed for names of species, it follows that they should not be used for the specific names of hybrids. In the French preliminary report this question is discussed at length on pp. 389–392 where it is stated that opinions were almost equally divided between those who favored the admission of vernacular names and those who did not, but the opinion of those favoring admission prevailed. As an example  $\times$  *Cattleya* Princesse Clémentine is cited, which should not have been translated into  $\times$  *C. Clementinae*, as done by Hurst & Rolfe, but retained in its original form. According to my opinion, however, both names can be used, if the distinction I have made above between botanical and horticultural names of varieties is applied also to hybrids. In this case the vernacular form  $\times$  *Cattleya* Princesse Clémentine would stand, following horticultural usage, only for the original cross, while  $\times$  *C. Clementinae*, according to botanical usage, would include, distinguished as varieties if necessary, all later crosses between the same parent species.

However much we may be convinced that by taking into consideration the Latin names of forms of cultivated plants, we shall incur many inconveniences, we cannot avoid it. As shown above, there is no difference between a botanical and a horticultural form, and as long as a horticultural form has received a name indistinguishable from a botanical name, it must be treated according to the rules of botanical nomenclature. Neither is it possible to exclude names published in garden catalogues, nursery price-



lists and the like provided they are accompanied by a sufficient description, since art. 35 says that publication is effected by the sale or public distribution of printed matter or indelible autographs, which does not exclude any class of publication. The only way to exclude such names would be by taking advantage of art. 36 which rules, that after January 1, 1908, the publication of names of new groups will be valid only when they are accompanied by a Latin diagnosis, but this rule is practically a dead letter, and I have as yet no knowledge of any name disregarded for this reason; considered as a recommendation art. 36 is excellent.

## TAXACEAE

*Taxus chinensis* (Pilger), spec. nov.<sup>1</sup> — *Taxus baccata* Franchet in Nouv. Arch. Mus. Paris, ser. 2, VII. 103 (Pl. David. I. 293) (1884), non Linnaeus; in Jour. de Bot. XIII. 264 (1899). — Pritzel in Bot. Jahrb. XXIX. 214 (1900). — Masters in Jour. Linn. Soc. XXIV. 546 (1902); XXXVII. 414 (1906); in Jour. Bot. XLI. 269 (1903). — *Taxus baccata* subsp. 2. *cuspidata* var. *chinensis* Pilger in Engler, Pflanzenr. IV. 5, 112 (Taxac.) (1903). — Patschke in Bot. Jahrb. XLVIII. 630 (1913). — *Taxus baccata* var. *sinensis* Henry in Elwes & Henry, Trees Gt. Brit. Irel. I. 100 (1906). — *Taxus cuspidata* var. *chinensis* Rehder & Wilson in Sargent, Pl. Wilson. II. 8 (1916).

Arbor 5-16-metralis; ramuli annotini et vetustiores plerumque cinereo-brunnei vel flavo-cinerei; gemmae pallide brunneae, perulis obtusiusculis, dorso fere planis v. inferioribus leviter carinatis, basi ramulorum non, vel partim tantum persistentibus. Folia biseriatim expansa, pleraque satis distantia, vix vel raro arcte contigua, falcata, 1.5-3 cm. longa, 2.5-4 mm. lata, apice plus minusve abrupte mucronulata, mediano supra plerumque leviter elevata, rarius prominente, subtus basi excepta obsoleto. Semen late ovoideum, 6 mm. longum et 5-6 mm. crassum, vix compressum, apice leviter bicarinatum, ceterum laeve, hilo fere orbiculari.

CHINA. Western Hupeh: *A. Henry* (No. 6913), *E. H. Wilson* (Arn. Arb. Exped. No. 1265, in part). Eastern Szechuan: *A. Henry* (No. 7097, 7155, type), *E. H. Wilson* (Veitch Exped. No. 624). Western Szechuan: *E. H. Wilson* (Arn. Arb. Exped. No. 1265, in part, No. 4053). Chekiang: *F. N. Meyer*, 1907 (No. 433). Shensi: *W. Purdom*, 1910. Kansu: *F. N. Meyer*, 1914 (No. 1790).

Opinions may differ if it is better to consider the different geographical forms of *Taxus* distinct species or varieties or subspecies of *T. baccata*, but whatever view is taken, the same rank should be given to the Chinese form as to the other geographical forms, and it should not be made a subdivision of *T. cuspidata*, as it differs from that species as much as the other species differ from each other. Its place seems to be between *T. cuspidata* and *T. Wallichiana* Zuccarini. *Taxus cuspidata* which is its nearest relation differs chiefly in the following characters: Winter-buds with acute, keeled, and rather loosely imbricated scales persistent at the base of the branchlets: leaves straight or nearly straight, generally shorter and very crowded and

<sup>1</sup> *T. chinensis* Roxburgh, Hort. Beng. 73 (1814) is a nomen nudum and therefore not valid; it is considered a synonym of *Podocarpus macrophyllus* Don.



overlapping, usually not distinctly distichous, more abruptly acuminate at the apex, with the midrib prominent above and conspicuous beneath; seed more compressed and with an elliptic hilum.

## PINACEAE

*Cupressus lusitanica* Mill. var. *Knightiana*, comb. nov. — *Cupressus Knightiana* Knight & Perry, Syn. Conif. 20 (1850), nom. — Carrière, Traité Conif., ed. 2, 158 (1867). — *Cupressus elegans* Low ex K. Koch, Dendr. II. pt. 2, 156 (1873), pro synon. — *Cupressus Bentharii* var. *Knightiana* Masters in Jour. Linn. Soc. xxxi. 340, f. 15 (1896). — Mottet, Conif. Tax. 92, fig. 10 (1902). — *Cupressus lusitanica* var. *Bentharii* Henry in Elwes & Henry, Trees Gt. Brit. Irel. V. 1177 (1910), pro parte, non Carrière.

This variety differs from the type chiefly in its distinctly pyramidal habit and in its regularly pinnate branchlet-system with the ultimate branchlets of nearly equal length and compressed; the leaves are acuminate and the mucro of the cone-scales large and conical. Henry identifies *C. Knightiana* with his *C. lusitanica* var. *Bentharii*, but the latter differs, as far as I can see, in the tetragonal, not or scarcely compressed, somewhat thicker branchlets, with the ultimate branchlets though likewise disposed in one plane less regular and not of almost equal length. The color of the leaves varies in both varieties from green to glaucous.

*Chamaecyparis obtusa* f. *tetragona*, comb. nov. *Retinispora tetragona aurea* Barron, Select. Cat. Conif. (opp. p. 12) (1875). — *Chamaecyparis obtusa tetragona aurea* Nicholson, Dict. Gard. i. 304 (1884-85). — *Cupressus obtusa tetragona-aurea* Masters in Jour. Linn. Soc. xxxi. 355 (1896).

The varietal name "aurea" is preoccupied by *C. obtusa aurea* Fortune apud Henckel & Hochstetter and as no other form named "tetragona" is known, this name should be used for the form under consideration.

× *Larix Henryana*, nom. nov. (*L. decidua* × *Kaempferi*). — *Larix ? europaea* × *leptolepis* Henry in Elwes & Henry II. 388 (1907). — *Larix hybrida* Farquhar, Cat. New Rare Pl. 7 (1916), nomen. — Rehder in Bailey, Stand. Cycl. Hort. vi. 3569 (1917).

Young branchlets yellowish, slightly bloomy; branchlets of the previous season yellow or grayish yellow, lustrous; bud-scales at the base of the shoots with scattered hairs inside; terminal buds conic-ovoid, red-brown, the lowest scales aristate, lateral buds globose-ovoid, obtuse, resinous, buds of spurs ovoid, their outer scales loose, with hairs at the base. Leaves glaucous, those of the spurs 2-5 cm. long, above with 1 or 2 lines of stomata on each side, below with 3-5 lines on each side and keeled; those of the shoots 1.5-2.5 cm. long and about 1.5 mm. broad, acute and mucronate, above with 2-4 lines on each side and below with 5-7 lines on each side, in cross-section compressed-rhombic, with a slightly raised midrib below. Cones not known.

*Larix Kaempferi* Sarg. is chiefly distinguished from the hybrid by the dense glaucous bloom covering the young branchlets and by the reddish color of the branchlets of the previous season, by the longer and broader



leaves, those of the shoots being about 3 cm. long and 1.75 mm. broad, flattened and with a distinctly raised midrib below; both kinds of leaves with more numerous rows of stomata.

*Larix decidua* Miller differs from the hybrid chiefly in the grayish yellow, not glaucous branchlets and the lustrous yellowish branchlets of the previous season, and in the narrower leaves of the shoots, about 1.25 mm. broad and not quite so compressed in the cross-section, the stomatiferous lines above composed of 2–3 lines and of 3–4 lines below, the leaves of the spurs with 1 line on each side above and with 2–3 lines beneath on each side.

This hybrid was first mentioned by A. Henry (l. c.) who states that plants were raised at his suggestion by the late D. Keir, head forester on the Atholl estates, from seeds of a tree of *L. Kaempferi* planted close to a common Larch, at Dunkeld, Scotland, and that Mr. D. Keir's son considers the plants intermediate between the two species.

Plants received from Dunkeld are growing at the Arboretum and form regularly pyramidal vigorous trees of which the tallest is now about 12 feet tall. In general appearance they resemble most *L. Kaempferi* except one plant which approaches somewhat *L. decidua*.

*Pseudolarix amabilis*, n. comb. — *Abies Kaempferi* Lindley in Gard. Chron. 1854, 255, 455, fig.; 1855, 644, fig.; non Lindley in Penny Cycl. i. 34 (1833).<sup>1</sup> — *Larix Kaempferi* Carrière in Fl. des Serr. xi. 97 (1856). — *Pseudolarix Kaempferi* Gordon, Pinet. 292 (1858). — *Larix amabilis* Nelson, Pinac. 84 (1866). — *Pinus Kaempferi* Parlatore in De Candolle, Prodr. xvi. pt. ii. 412 (1868), non Lambert. — *Pseudolarix Fortunei* Mayr, Monog. Abiet. Jap. 99 (1890). — *Laricopsis Kaempferi* Kent, Veitch's Man. Conif. 404 (1900).

As the combinations with the specific name "Kaempferi" are based on the non-valid name *Abies Kaempferi* Lindley of 1854, they must be all considered non-valid and the specific name must be replaced by the next oldest which is *Larix amabilis* Nelson. Mayr in giving the new name *P. Fortunei* to this tree was apparently not aware that it had been called *Larix amabilis* in the little known and usually neglected book of J. Nelson.

*Abies homolepis* Sieb. & Zucc. var. **tomomi**, var. nov. — *Abies tomomi* Bobbink & Atkins, [Cat.] 13 [1909?], sine descriptione.

This forms a slenderer and more sparingly branched tree than the type; the leaves are shorter, about 0.8–1.5 cm., rarely 2 cm. long.

A plant received from Bobbink & Atkins in 1916 is growing in the Arnold Arboretum. I have also seen it growing in the New York Botanic Garden

<sup>1</sup> *Abies Kaempferi* Lindley of 1833 is based on *Pinus Kaempferi* Lambert which is identical with *Abies leptolepis* Sieb. & Zucc. of 1842. As "Kaempferi" is the oldest specific name for this Larch, Sargent was correct in reestablishing this name; for the older homonym *Larix Kaempferi* Carrière which belongs to *Pseudolarix amabilis* is a non-valid name, as pointed out above, and according to the International Rules it cannot prevent the reestablishment of the older name. The result would be the same, if one considers *Larix Kaempferi* Carr. and also *Abies Kaempferi* Lindley of 1854 as belonging partly, as to the name-bringing synonym, to the Japanese Larch, and partly, as to the description, to the Chinese Gold-Larch. For a complete enumeration of synonyms of *L. Kaempferi*, the Japanese Larch, see Wilson, Conif. Jap. 30 (1916).



where it was received from Hicks & Son in 1907 and again in 1914 from Bobbink & Atkins. Specimens are preserved of all these plants in the herbarium of the Arnold Arboretum.

× *Abies insignis* Carrière apud Bailly in Rev. Hort. 1890, 230. (*A. Nordmanniana* X *Pinsapo*). — *A. pseudopinsapo* Carrière in Rev. Hort. 1879, 444, 474, sine descriptione. — *Pinus insignis* Voss in Putlitz & Meyer, Landlex. iv. 774, 775 (1913), non Douglas.

The original plant of this hybrid was raised by Renault, Bulgnéville, France, in 1872 from seed of *A. pinsapo* fertilized probably by *A. Nordmanniana refracta* Carr. (see Bailly in Rev. Hort. 1890, 230). Later hybrids of the same parentage were raised and subsequently described under binomial designations. This is not correct according to the International Rules which provide that such forms should be classed under the hybrid first described like subdivisions of a species.

× *A. insignis* var. *speciosa*, comb. nov. — *Abies Nordmanniana* Hort. apud Bailly in Rev. Hort. 1890, 231.

This cross was raised about the same time as the original cross by Croux of Sceaux near Paris from seed of *Abies Nordmanniana* fertilized by *A. pinsapo*.

× *A. insignis* var. *Beissneriana*, comb. nov. — *Abies Beissneriana* Mottet in Rev. Hort. 1902, 163.

This cross was raised like the following three forms by Moser of Versailles in 1878 from seed of *A. pinsapo* fertilized by *A. Nordmanniana*. Mottet's name cannot invalidate the later *A. Beissneriana* Rehder & Wilson, a species of China, as it is a non-valid name, being given to a hybrid which already was provided with a specific name.

× *A. insignis* var. *Kentiana*, comb. nov. — *Abies Kentiana* Mottet, l. c.

× *A. insignis* var. *Andreana*, comb. nov. — *A. Andreana* Mottet, l. c.

× *A. insignis* var. *Mastersiana*, comb. nov. — *A. Mastersiana* Mottet, l. c.

*Abies spectabilis* Spach var. *brevifolia*, comb. nov. — *A. Webbiana* var. *brevifolia* A. Henry in Elwes & Henry, Trees Gt. Brit. iv. 751 (1909).

This according to Henry is the form of the northwestern Himalayas where it grows above *A. pindrow* Spach at elevations of 10–14000 feet. It chiefly differs from the type in its shorter leaves not exceeding 3 cm. in length, grayish beneath with inconspicuous stomatic bands. The tree is in cultivation in England, but the date of its introduction is uncertain; it is certainly hardier than the type.

*Abies alba* Miller, Dict. ed. 8, No. 1 (1768). — Nymann, Conspectus Fl. Eur. 673 (1878). — Ascherson & Graebner, Syn. Mitteleur. Fl. i. 191 (1897). — *Pinus Picea* Linnaeus, Spec. ii. 1001 (1753). — *Pinus Abies* Duroi, Obs. Bot. 39 (1771). — *Pinus pectinata* Lamarck, Fl. Franç. ii. 202 (1778). — *Abies vulgaris* Poiret in Lamarck, Encycl. Méth. vi. 514 (1804). — *Abies pectinata* De Candolle in Lamarck, Fl. Franç. iii. 276 (1805). — *Abies Picea* Bluff & Fingerhut, Comp. Fl. Germ. ii. 541 (1825), non Miller. — Lindley in Penny Cycl. i. 29 (1833). — *Picea pectinata* Loudon, Arb. Brit. iv. 2329 (1838).



As far as I can see *Abies alba* is the correct name for the European Silver Fir. Though the oldest name for the species is *Pinus Picea* Linnaeus, the combination *Abies Picea* Bluff & Fingerhut cannot be accepted, as there is the older homonym *Abies Picea* Miller which is a valid name being the correct name of the European Spruce under the genus *Abies*. One may possibly question the validity of Miller's name *Abies Picea*, as the oldest name is *Pinus Abies*, but if that specific name had been used for the combination, it would have been against art. 55, 2° and likewise against the usage of all the older botanists. Therefore it was necessary to select a new specific name. It is certainly unfortunate that Miller used the name *Abies Picea* for the European Spruce, but as Miller did not base his names under *Abies* on any of the species published previously by Linnaeus under *Pinus*, his name is not an erroneous transfer, but a new specific name, given by Miller for the reason that *Picea* was the generally accepted prelinnean name for the Spruce and therefore according to his view the correct name. The objection, however, may be raised against the name *Abies alba* Miller, that it could not be considered a valid name, as it has been formed against the rules, which no doubt is the case, but as the correct combination is preoccupied, it is the next oldest name and therefore the valid name for this species. For those who follow the Philadelphia Code there can be no question that *Abies alba* is the correct name, as the combination *Abies Picea* is preoccupied by an older homonym, and by those who still follow the so-called Kew Rule *Abies alba* is to be accepted as the first name under the correct genus.

*Abies alba* f. *columnaris*, comb. nov. — *Abies pectinata columnaris* Carrière in Rev. Hort. 1859, 39; Traité Conif. ed. 2, 282 (1867). — *Pinus Picea* f. *columnaris* (Carr.) Voss in Putlitz & Meyer, Landlex. iv. 774 (1913).

A form with very short branches of nearly equal length forming a columnar head. There is another columnar form *A. alba* f. *pyramidalis* (Carr.) Voss in which the columnar shape is caused by a different mode of branching similar to that of the Lombardy Poplar.

*Abies lasiocarpa* f. *compacta*, comb. nov. — *Abies subalpina compacta* Beissner in Mitt. Deutsch. Dendr. Ges. ix. 64 (1900); Handb. Nadelholzk. ed. 2, 183 (1909). — *Pinus lasiocarpa* f. *compacta* Voss in Putlitz & Meyer, Landlex. iv. 776 (1913).

This dwarf compact form was first described in 1900 by Beissner who states that he had seen specimens about 1 m. in diameter, but he says nothing about the origin. At the Arnold Arboretum a dwarf compact form was raised from seed sent by Dr. C. C. Parry in 1873 from Colorado. Beissner in 1909 also mentions a similar form originated in 1890 in the nursery of Mr. Ordnung in Eisenberg, Bohemia.

*Picea Abies* Karst. f. *argenteo-spica*, comb. nov. — *P. excelsa argenteo-spica* Hesse apud Beissner, Handb. Nadelh. 367 (1891). — *P. excelsa argenteo-spicata* Beissner in Mitt. Deutsch. Dendr. Ges. vi. 50 (1897); Handb. Nadelh. ed. 2, 240 (1909). — *Pinus Abies* f. *argentei-spicata* Voss in Putlitz & Meyer, Landlex. iv. 770 (1913).



*Picea Abies* f. *cincinnata*, comb. nov. — *Picea excelsa cincinnata* Hesse apud Beissner in Mitt. Deutsch Dendr. Ges. vi. 92 (1897).

*Picea Abies* f. *elegans*, comb. nov. — *Abies excelsa*  $\beta$ . *elegans* Forbes, Pinet. Woburn, 90 (1839). — *Pinus excelsa elegans* Rinz in Gartenfl. vi. 334 (1857), nomen. — *Picea excelsa elegans* Beissner, Handb. Nadelh. 363 (1891).

*Picea Abies* f. *Ellwangeriana*, comb. nov. — *Picea excelsa Ellwangeriana* Beissner, Handb. Nadelh. 366 (1891). — *Abies excelsa Ellwangeriana* Hort. ex Beissner, l. c., as synon.

*Picea Abies* f. *Merkii*, comb. nov. — *Picea excelsa* var. *Merkii* Beissner in Jaeger & Beissner, Ziergeh. ed. 2, 440 (1884). — *Abies excelsa Merkii* Dieck, Haupt-Cat. Zoeschen, 86 (1885), nom.

*Picea Abies* f. *monstrosa*, comb. nov. — *Abies excelsa* 11. *monstrosa* (Hort.) Loudon, Arb. Brit. iv. 2295 (1838). — *Abies aelada* Savi in Flora, xxvii. 519 (1844). — *Pinus Abies* 11. *monstrosa* Antoine, Conif. 92 (1842-45). — *Pinus Picea* var.  $\lambda$ . *monstrosa* Endlicher, Syn. Conif. 118 (1847). — *Pinus excelsa monstrosa* Rinz in Gartenfl. vi. 334 (1857), nom. — *Picea excelsa* l. *monstrosa* Regel, Russk. Dendr. ed. 2, 33 (1883). — Beissner, Handb. Nadelh. ed. 2, 266 (1909), non ed. 1 (1891), nec 1884, necque *P. excelsa monstrosa* Carrière. — *Picea excelsa*  $\epsilon$ . *monocaulis* Noerdlinger apud Willkomm, Forst. Fl. ed. 2, 76 (1887). — Boehm in Zeitschr. Forst. Jagdwes. xxv. 227, fig. (1895). — *Picea vulgaris* f. *monocaulis* Beck, Niederoestr. Fl. i. 7 (1890). — *Picea excelsa* l. *monocaulis* Ascherson & Graebner, Syn. Mitteleur. Fl. i. 198 (1897). — *Picea excelsa* *lusus montrosa* [sic] Schroeter in Vierteljahrsschr. Naturf. Ges. Zuerich, XLIII. 170 fig. 18 (Vielgestalt. Fichte, 50) (1898).

The name *monstruosa* had been applied by Carrière and *monstrosa* by Beissner in his earlier publications to a sparingly branched form, but Loudon describes a form with a single unbranched thick stem.

*Picea Abies* f. *parviformis*, comb. nov. — *Abies excelsa parviformis* Maxwell in Horticulturist xxix. 201 (1874). — R. Smith, Pl. Fir. Tribe, 5 (187.?). — *Picea excelsa parviformis* Otto in Hamburg. Gart. Blumenzeit. xxii. 158 (1866), nom. — Beissner, Syst. Einth. Conif. 37 (1887).

*Picea Abies* f. *procumbens*, comb. nov. — *Abies excelsa procumbens* A. Murray, in Ravenscroft, Pinet. Brit. ii. 138 (1867). — *Picea excelsa procumbens* Carrière, Traité Conif. 251 (1855).

*Picea Abies* f. *pygmaea*, comb. nov. — *Abies excelsa* 8. *pygmaea* Loudon, Arb. Brit. iv. 2295 (1838). — *Pinus Abies* 8. *pygmaea* Antoine, Conif. 91 (1842-45). — *Pinus Picea* var.  $\theta$ . *pygmaea* Endlicher, Syn. Conif. 118 (1847). — *Abies pygmaea* (Fisch.) Wenderoth, Pflanz. Bot. Gaert. i. Conif. 17 (1851). — *Picea excelsa pygmaea* Carrière, Traité Conif. 250 (1855). — *Pinus excelsa pygmaea* Rinz in Gartenfl. vi. 334 (1857), nom.

*Picea Abies* f. *pyramidata*, comb. nov. — *Picea excelsa pyramidata* Carrière, Traité Conif. 247 (1855). — *Abies excelsa* Hort. apud Gordon, Pinet. Suppl. 5 (1862). — *Picea excelsa pyramidalis* Vos, Bered. Woordenb. Heest. Conif. 176 (1867). — *Picea excelsa* f. *pyramidalis* Berg in Schrift. Naturf.



Ges. Dorpat, II. 17, t. 6 (1887). — *Picea excelsa* lusus *erecta* Schroeter in Vierteljahrsschr. Naturf. Ges. Zuerich, XLIII. 89 (1898). — *Picea excelsa* var. *europaea* lusus *pyramidata* Schroeter in Ber. Schweiz. Bot. Ges. XIII. 107, fig. 3 (1903). — *Picea excelsa* var. *pyramidalis* subvar. *pyramidata* Schneider in Silva-Tarouca, Uns. Freil.-Nadelh. 230 (1913). — *Picea Abies* var. *pyramidalis* Nash in Jour. N.Y. Bot. Gard. XVIII. 89 (1917).

*Picea Abies* f. *Remontii*, comb. nov. — *Abies excelsa* *Remontii* R. Smith, Pl. Fir Tribe, 5 (187?). — *Picea excelsa* *Remontii* Beissner, Syst. Einth. Conif. 37 (1887). — Purpus in Moeller's Deutsch. Gaertn.-Zeit. XXI. 557, fig. 4 (1906). — Schneider in Silva-Tarouca, Uns. Freil.-Nadelh. 230, fig. 206 (1913).

*Picea glauca* f. *aurea*, comb. nov. — *Abies canadensis* *aurea* Nelson, Pinac. 32 (1866). — *Picea alba* *aurea* Seneclauze, Conif. 23 (1868). — Beissner, Handb. Nadelh. 343 (1891). — *Picea laxa* f. *aurea* Voss, Vilmorin's Blumengaert. ed. 3, I. 1241 (1896). — *Picea canadensis* *aurea* Sudworth in U.S. Dept. Agric. Div. For. Bull. XIV. 38 (Nomencl. Arb. Fl.) (1897).

Though the oldest name for the White Spruce is *Abies canadensis* Miller, the specific name "*canadensis*" cannot be used under *Picea*, as there exists already the older homonym *P. canadensis* Link which is the valid name for the Hemlock Spruce under the genus *Picea*. Therefore the specific name of the next oldest binomial which is *Pinus glauca* Moench (1785) has to be used and the correct name of the White Spruce becomes *Picea glauca* Voss (see also Sargent in Bot. Gaz. LXVII. 208, 1919).

*Picea glauca* f. *coerulea*, comb. nov. — *Abies alba* *glauca* Dimsdale apud Knight & Perry, Syn. Conif. 36 (1850), nom. — Plumbly apud Gordon, Pinet. 3 (1858). — *Abies alba* *coerulea* Nelson, Pinac. 47 (1866). — *Picea alba* *coerulea* Carrière, Traité Conif. ed. 2, 320 (1867), pro parte. — *Picea alba* *glauca* Hort. apud Sénéclauze, Conif. 23 (1868). — *Picea laxa* f. *coerulea* Voss, Vilmorin's Blumengaert. ed. 3, I. 1241 (1896). — *Picea canadensis* *glauca* (Moench) Sudworth in U.S. Dept. Agric. Div. For. Bull. XIV. 37 (Nomencl. Arb. Fl.) (1897). — *Picea alba* var. *argentea* Zederbauer in Sitzber. Akad. Wiss. Wien Math.-Nat. Kl. CXVI. 1938 (1907). — *Picea canadensis* var. *coerulea* Schneider in Silva-Tarouca, Uns. Freil.-Nadelh. 224 (1913). — *Pinus glauca* f. *coerulea* Voss in Putlitz & Meyer, Ländlex. IV. 771 (1913).

This is a form with very glaucous, sometimes nearly silvery white leaves. The varietal name *coerulea* starts with *Abies alba* *coerulea* Nelson which is not based on any previously published name; the earlier varietal name *glauca* cannot be used, as it would repeat the specific name without designating the type. The plant described as *Abies rubra* var. *coerulea* Loudon, *Picea coerulea* Link or *Pinus rubra*  $\beta$ . *violacea* Endlicher has been often referred to this form, but according to the description it is apparently a form of *P. mariana* Britton, Sterns & Poggenburg.

*Picea glauca* f. *nana*, comb. nov. — *Abies alba* var. *nana* Jacques in Ann. Fl. Pom. v. 326 (1836); Monog. Conif. 67 (1837). — Loudon, Arb. Brit. IV. 2311 (1838). — *Pinus alba* *nana* Antoine, Conif. 87 (1842-45). — *Pinus*



*alba*  $\beta$ . *nana* (Loud.) Endlicher, Syn. Conif. 113 (1847). — *Picea alba nana* Carrière, Traité Conif. 239 (1855). — *Abies alba prostrata* Hort. ex Beissner, Handb. Nadelh. 342 (1891), as synonym of *P. alba nana*. — *Picea canadensis nana* (Loud.) Sudworth in U.S. Dept. Agric. Div. For. Bull. xiv. 38 (Nomencl. Arb. Fl.) (1897).

## GRAMINEAE

*Sasa Veitchii*, n. comb. — *Phyllostachys bambusoides*  $\beta$ . *albo-marginata* Miquel in Ann. Mus. Bot. Lugd.-Bat. ii. 284 (Prol. Fl. Jap. 172) (1866). — *Bambusa senanensis?*  $\beta$ . *albo-marginata* Franchet & Savatier, Enum. Pl. Jap. ii. 606 (1879). — *Bambusa Veitchii* Carrière in Rev. Hort. 1888, 90. — Watson in Gard. Chron. ser. 3, iii. 382 (1888). — *Arundinaria Veitchii* N. E. Brown in Gard. Chron. ser. 3, v. 521 (1889). — *Bambusa albo-marginata* Makino in Descr. Prod. For. Paris Exp. 37 (1900); in Tokyo Bot. Mag. xiv. (62) (1900), nomen. — *Arundinaria albo-marginata* Makino in Tokyo Bot. Mag. xiv. 30 (1900). — *Sasa albo-marginata* Makino & Shibata apud Makino & Shirasawa, Icon. Bamboos Jap. 45, t. 11, figs. 21–27 (1900); in Tokyo Bot. Mag. xv. 25 (1901).

## JAPAN.

Makino took up the oldest varietal name for the species, but the existence of a previous binomial makes that new combination inadmissible according to the International Rules, as in the case of the following species.

*Sasa Veitchii* f. *minor*, n. comb. — *Arundinaria albo-marginata* f. *minor* Makino in Tokyo Bot. Mag. xiv. 32 (1900). — *Bambusa albo-marginata* f. *minor* Makino ex Makino, l. c., pro synonym. — *Sasa albo-marginata* f. *minor* Makino & Shibata in Tokyo Bot. Mag. xv. 25 (1901). — *Sasa albo-marginata* f. *nana* Camus, Bambus. 21, t. 3, fig. c (1913).

*Sasa senanensis*, comb. nov. — *Arundinaria kurilensis*  $\gamma$ . *paniculata* Fr. Schmidt in Mém. Acad. Sci. St. Pétersb. ser. 7, xii. no. 2, 198 (Fl. Sacchal.) (1868). — *Bambusa senanensis* Franchet & Savatier, Enum. Pl. Jap. ii. 182, 606 (1879). — Hackel in Bull. Herb. Boiss. vii. 719 (1899). — *Arundinaria palmata* Marliac apud Bean in Gard. Chron. ser. 3, xv. 368, f. 19 (p. 167) (1894). — *Bambusa tessellata* Makino in Tokyo Bot. Mag. ix. 73 (1895), non Munro. — *Bambusa paniculata* Makino in Descr. Prod. For. Paris Exp. 37 (1900); in Tokyo Bot. Mag. xiv. (62) (1900), nomen. — *Arundinaria paniculata* Makino in Tokyo Bot. Mag. xiv. 50 (1900). — *Sasa paniculata* Makino & Shibata apud Makino & Shirasawa, Icon. Bamboos Jap. 47, t. 11, figs. 7–15 (1900); in Tokyo Bot. Mag. xv. 25 (1901). — Camus, Bambus. 24, t. 2, figs. c, d (1913).

## JAPAN.

*Sasa senanensis* f. *nebulosa*, comb. nov. — *Bambusa palmata* f. *nebulosa* Makino in Descript. Prod. For. Paris Exp. 37 (1900); in Tokyo Bot. Mag. xiv (61) (1900), nomen. — *Arundinaria paniculata* f. *nebulosa* Makino in Tokyo Bot. Mag. xiv. 61 (1900). — *Arundinaria paniculata* f. *nebulosa* Makino in Tokyo Bot. Mag. xiv. 52 (1900). — Makino & Shirasawa, Icon. Bambus. Jap. 49, t. 7, figs. 6–9 (sub *Sasa* in tab.) (1900). — *Sasa paniculata*



*f. nebulosa* Makino & Shibata in Tokyo Bot. Mag. xv. 26 (1901). — *Sasa paniculata* var. *nebulosa* Camus, Bambus. 24 (1913).

*Sasa senanensis* var. *stenantha*, n. comb. — *Bambusa stenantha* Makino in Descript. Prod. For. Paris Exp. 37 (1900), nomen; in Tokyo Bot. Mag. xiv. (62) (1900). — *Arundinaria paniculata* var. *stenantha* Makino in Tokyo Bot. Mag. xiv. 52 (1900). — *Sasa paniculata* var. *stenantha* Makino & Shibata in Tokyo Bot. Mag. xv. 26 (1901). — Camus, Bambus. 24 (1913).

*Sasa paniculata* var. *nana* Makino & Shibata is *S. nana* Makino in Tokyo Bot. Mag. xxvi. 11, fig. 1 (1912). Of *S. paniculata* var. *Ontakensis* (Franch. & Sav.) Camus, Bambus. 24, t. 2, fig. B (1913) and var. *depauperata* Camus, l. c. 25 I am not quite certain if they belong here.

#### JUGLANDACEAE

*Carya cathayensis* Sargent, Pl. Wilson. III. 187 (1916).

This interesting recent addition to the Chinese flora had been known only from the type locality, the mountains round Changhua Hsien in the province of Chekiang, where it was discovered in 1915 by F. N. Meyer and later also collected by D. Macgregor; therefore it was considered a tree of very restricted distribution. A collection of Chinese woody plants, however, recently received at the Arboretum contained a specimen of this species from Kweichow where it had been found by Dr. H. von Handel-Mazetti as a cultivated tree between Kutchou and Liping at an altitude of 950 m. near the village of Mantunggai in the extreme southeastern part of Kweichow near the border of Hunan and Kwangsi. This of course leaves it doubtful whether the tree is growing spontaneously in that region or not, but it seems more likely that it was brought from the neighboring mountains than that it has been introduced from the province of Chekiang, a distance of about 750 miles. If the Chinese Hickory were frequently cultivated by the Chinese, it would seem strange that such a distinct and handsome tree had not been discovered earlier in some of the better explored regions of China. The spontaneous occurrence of *Carya cathayensis* in Kweichow would extend its range southwestward from 119° to 109° E. Long. and would make probable the occurrence of this tree in Kiangsi, Hunan and possibly Kwangsi.

#### BETULACEAE

*Carpinus Handellii*, spec. nov.

Arbor "speciosa"; ramuli novelli dense molliter villosi-pilosi, annotini glabrescentes vel glabri, fusco-brunnei, obscure lenticellati. Folia oblongo-ovata vel elliptico-lanceolata, satis longe acuminata, basi leviter obliqua, late cuneata vel subrotundata, 5–10 cm. longa et 1.8–3.6 cm. lata, subsimpliciter mucronato-serrulata dentibus modice inaequalibus saepe fere ad mucronem reductis plerisque nervos terminantibus, nervis utrinque 14–16, supra leviter impressis, subtus prominentibus et trabeculis approximatis elevatis conjunctis, juniora utrinque dense villosa, maturitate chartacea,



supra costa minute puberula excepta glabra, subtus praecipue ad costam, nervos et venulos dense breviter pilosa, in costa pilis sericeis interspersis, in axillis barbulata; petioli 2–4 mm. longa, dense breviter pubescentes. Inflorescentia fructifera satis densa, pedunculo 1.5–2 cm. longo incluso 8–9 cm. longa; bractae semiovatae, circiter 2 cm. longae et 8 mm. latae, margine convexiore dentatae dentibus paucis latis brevibus interdum fere obsoletis, latere recto integrae vel subintegrae, basi leviter inflexae et basin nuculae amplectentes, basi circiter 5-costatae costis et nervis extus adpresse pubescentibus intus fere glabris; nuculae late ovoideae, compressae, 8–9-costatae, perigonio coronatae, minute pilosulae, apice longius pilosae, resinosae.

CHINA. Hunan: inter urbes Linling (Yungchoufu) et Sinning in silvis collium supra vicum Tjentiesse, alt. 400 m., Aug. 14, 1917, *H. von Handel-Mazetti* (No. 421, type); in silva infra Tungdjiapaï prope minas Hsikwangschan, dist. Hsinhwa, alt. 550 m., May 20, 1918, *H. von Handel-Mazetti* (No. 534, "arbor excelsa").

This is a well-marked species of the section *Eucarpinus*, characterized chiefly by the rather large, short-petioled, closely veined, nearly simply serrate leaves with small mucronate teeth, by the dense villose pubescence of the young branchlets and leaves, by the short-pilose pubescence of the under side of the mature leaves, silky or wanting in most other species, by the shallowly dentate, not lobed bracts and the minutely pilose resin-dotted nutlets. *Carpinus Handelii* is apparently most closely related to *C. Tschonoskii* Maxim. and *C. polyneura* Franch.; the first differs chiefly in its longer petioles 0.5–1.5 cm. long, in the doubly serrate leaves glabrous beneath except a silky pubescence on the veins, and in the glabrous nutlets; the second species in its smaller, slender-petioled leaves with larger and fewer simple teeth, in the smaller fruiting catkins and in the absence of resin-dots on the nutlets. In the size, shape and serration of the leaves the new species resembles the Himalayan *C. faginea* Lindley, but that species has the leaves glabrous beneath, at least at maturity except the silky-pubescent midrib and secondary veins, and has smaller more sharply serrate-dentate bracts and apparently no resin-dots on the nutlets (only immature fruit seen).

*Betula pendula* Roth f. *viscosa*, comb. nov. — *Betula dentata viscosa pyramidalis* L. Chenault & Fils, Cat. 1912/13, 3. — *Betula verrucosa* var. *dentata viscosa* Bean, Trees & Shrubs, 1. 264 (1914).

A slow-growing bushy tree of dense pyramidal habit; young branchlets densely glutinous-verrucose; leaves triangular-ovate, 3–6 cm. long, acuminate, truncate or occasionally subcordate at the base incisely and doubly dentate and lobulate, glabrous with glandular dots beneath; petioles 0.4–1 cm. long. In the shape of its leaves it resembles somewhat *B. alba* var. *urticaefolia* Spach, but it is perfectly glabrous and the branchlets are very resinous. In habit it has some resemblance to *B. pendula* f. *fastigiata* K. Koch, but the leaves are more deeply and coarsely toothed, the petioles are shorter and the branchlets more densely resinous.

(To be continued)





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