TYPIFICATION WITHIN THE POLYPODIUM VIRGINIANUM
COMPLEX (POLYPODIACEAE)

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Summary

The validity and application of specific and varietal names in the Polypodium virginianum complex were investigated. Lectotypification of both P. virginianum L. and P. vulgare L. var. americanum Hooker is proposed, the former based on a plate in Morison and the latter on a collection by Percival at Kew. On morphological grounds, the types of both taxa appear to represent the tetraploid race in the complex. Hooker's variety therefore becomes a later synonym of the Linnaean species. Polypodium vinlandicum Löve and Löve was based on the type of Hooker's variety and thus is also synonymous with the tetraploid cytotype of P. virginianum. The name Polypodium "oreophilum" has sometimes been accepted as a legitimate name for some West Virginian plants in the complex. The combination, however, was never validly accomplished and so must be rejected. Furthermore, the use of the epithet for any member of this group is now prohibited by the South American P. oreophilum Maxon.

The presence of two cytological races of Polypodium virginianum L., a diploid with \( n = 37 \) and a tetraploid with \( n = 74 \), has been recognized for nearly thirty years (Manton and Shivas, 1953). In addition, a triploid hybrid derivative, with 37 bivalents and 37 univalents at meiotic metaphase, is frequent throughout the ranges of the sexual cytotypes (Evans, 1970). The presence of viable "giant" spores in the otherwise malformed products of meiosis and the discovery of triploids in populations where one or both parents are absent suggest that the triploid may be incipiently apogamous (Evans, 1970).

Several workers (Evans, 1970; Cranfill, 1980; Kott and Britton, 1982) have outlined the morphological differences between these cytotypes. Lloyd and Lang (1964) suggested that the tetraploid race probably represented an allopolyploid derived from a cross of diploid P. virginianum with the western diploid P. amorphum Suksdorf (=P. montense Lang), although artificial synthesis of the hybrid has not been accomplished.

As the relationships within the complex become more fully resolved, it may be necessary to accord subspecific or specific rank to the several cytotypes. While we feel nomenclatural innovations would be premature at this time, we do feel it useful and important to clarify the existing nomenclature of the complex at the specific level.

Löve and Löve (1977) tacitly maintained that the type of P. virginianum L. was diploid. To verify that assumption, we consulted Linnaeus’ protologue. No material is directly cited by Linnaeus (1753), nor is there any specimen of the species at LINN or in Hortus Cliftonianus (a fact noted by Alston in his copy of Species at the BM; Jermy, pers. comm.). In the absence of a specimen, we turned to the illustrations cited by Linnaeus. Although three plates are enumerated, it is clear from the species description, locality, and the specific epithet that Linnaeus intended his species to be based on Virginian plants. The drawings of Plumier and Petiver were based on tropical American plants and do not fit Linnaeus’ observation that P. virginianum, compared to P. vulgare, is "similis, sed minor." The illustration cited by Linnaeus from Morison’s (1699) Historiae (see Fig. 1), however, clearly depicts the North American plant. Except for the comment "radice laeve" (which can be

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found rarely in very old portions of the rhizome), the plate and description agree well with *P. virginianum*. We therefore choose Morison's plate (III. p. 563, fol. 14, tab. 2, fig. 3) as lectotype. Unfortunately the locality of "Virginia," even in its restricted sense today, is insufficient to link this name to any of the cytotypes, since all occur throughout the eastern United States. Several features of this crude plate, however, such as the rounded blade segments, oblongish blade with reduced basal segments, and the unlobed apical segment, lead us to equate the illustration with the tetraploid race. Although some might argue for rejection of the name, because of uncertain typification, we feel the justification for its retention is strong. This action stabilizes and anchors a name that is as entrenched in botanical literature as any name can get. Because the tetraploid is more widespread, this designation will require fewer annotations, fewer changes in floras and will retain the familiar binomial for the common plant should the cytotypes be accorded specific rank.

The name *P. vinlandicum*, based on *P. vulgare var. americanum* Hooker, was proposed by Löve and Löve (1977) for the tetraploid cytotype. As we have shown above, *P. virginianum* is the proper name for the tetraploid so that this calls into doubt the status of the Löves' name. Hooker (1840) described his new variety from Canadian material, commenting: "This is no doubt the *P. virginianum* of Linnaeus and authors, as far as regards the Virginia plant, on which Linnaeus founded his character..." (p. 258).

Although Hooker indicated that his plants were probably the same as Linnaeus', his uncertainty about other elements cited by Linnaeus along with the trouble he took to describe var. *americanum* suggest to us that he was not merely reducing *P. virginianum* to varietal status. Interpretation of *P. vinlandicum*, consequently, rests on the identity of Hooker's syntypes. With the help of Drs. A. C. Jermy and B. S. Parris, we were able to examine these sheets. As we had suspected from the distributions of different races, the types mostly included material of tetraploid morphology as determined by the criteria of spore size and gross morphology (Kott and Britton, 1982). The material of Mrs. Percival, a well-known early collector of material from the vicinity of Quebec City, was mounted on two sheets with tetraploid individuals on one and diploid-like individuals on the other.
Fig. 2. Sheet of mixed Polypodium with lectotype of P. vulgare L. var. americanum Hooker, collection of Mrs. Percival.

The specimens of Drummond are apparently P. amorphum while those of Pursh are tetraploid P. virginianum. Richardson’s material (Slave River, Canada) embrace a mixture of P. virginianum (4x and perhaps 2x as well, although we were not able to confirm this from spores), P. amorphum, and P. vulgare, possibly added later. As most of the material
examined by Hooker is tetraploid, and since his description (e.g., "... with narrower, more oblong fronds ...") is compatible with the morphology of that cytotype, we choose the central individual from Mrs. Percival's tetraploids (see Fig. 2) as lectotype of Hooker's variety. Accordingly, *P. vinlandicum* Løve and Løve represents a heterotypic synonym of *P. virginianum* L.

*Polypodium "oreophilum"* is the only other name at the rank of species that has been employed in this complex. Cited in the Gray Card Index as "*P. oreophilum* (Maxon) Anon. in index" and in Broun (1938) as "*P. oreophilum* (Maxon) Knowlton et al.," the combination first appears in the index of the same work where Maxon described *P. vulgare var. oreophilum*. Patently illegitimate, it was probably a mistake in compilation of the index to this work (Morris, 1900) and should never have been taken up by subsequent investigators. Furthermore the use of *oreophilum* is now prohibited by *P. oreophilum* Maxon, a South American species belonging to *Grammitis*.

In summary, there are only two legitimate names available at the rank of species for the *P. virginianum* complex, *P. virginianum* L. and *P. vinlandicum* Løve and Løve. Both have tetraploids as types and therefore remain synonymous even if cytotypes are treated as species. If the diploid is described, it will require a new name.

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**Literature Cited**


