In a further experiment attempts were made to purify the preparation of *Fusarium* 'protoplasts' obtaining osmotic bodies essentially free from whole hyphae or debris, but recovery was generally low because of settling of heavier protoplasts.

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CYTOLOGY

New Evidence on the Cytotaxonomy of *Vaccinium* Species as revealed by Stomatal Measurements from Herbarium Specimens

In an earlier paper¹, we described two groups of lowbush blueberry plants, one diploid and the other tetraploid, the taxonomic status of which was in confusion. Both groups resembled *Vaccinium angustifolium* Ait., yet were different enough from each other to warrant separation as species. Four characters were considered to be of value in separating the two species: chromosome number, corolla-length, degree of branching, and pollen grain size. On inquiry, we found that the type specimen of *V. angustifolium* consists of two unbranched shoots without flowers and with unknown chromosome number. Therefore, none of our characters could be used to

compare the type with our two species. Moreover, since both species occur in the locality where the type specimen was originally collected, it was impossible to identify positively the type with either of them. Although it was recognized that vegetative characters of lowbush blueberries vary greatly under different environmental conditions, such characters were the only ones that could be used in making the comparison. Since the leaves of the type specimen were similar in size to those of the tetraploid plants and larger than those of the diploid ones, we considered the tetraploid species to be *V. angustifolium* and the diploid one was named *Vaccinium boreale* sp. nov.

Dr. W. G. Dore, of the Plant Research Institute, Ottawa, has suggested that stomatal measurements from leaf peels of herbarium specimens might be used as an indication of chromosome number. Dr. J. F. M. Cannon, of the British Museum (Natural History), kindly supplied us with cellulose acetate peels taken from the type specimen of *V. angustifolium*. We prepared peels from herbarium specimens of 12 plants of each of our two species using the same technique². We examined all 25 preparations, taking 20 measurements from each of our preparations and 40 from the preparation of the type specimen. Although there is some overlapping between plants of the two chromosome groups, it is clear that measurements of the type specimen fall within the range of the tetraploid plants and outside the range of the diploid plants (Fig. 1). This evidence strongly supports the conclusion that the type-specimen belongs in the tetraploid group and not in the diploid one. Thus, on the basis of present data, the tetraploid, common lowbush blueberry of eastern Canada must be called *V. angustifolium*, and the name *V. boreale*, proposed previously by us for the diploid species, remains valid. Moreover, the name *Vaccinium lamarkii* Camp, which was proposed for the tetraploid group on the assumption that *V. angustifolium* was diploid³, must be considered invalid because the two names refer to the same group of plants, and the name *V. angustifolium* takes precedence.

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Fig. 1

Deoxyribonucleic Acid Content of Syncytial Nuclei treated with Papain and Trypsin

SYNCYTIAL nuclei, following isolation and staining by Feulgen's reaction, form an irregular pattern consisting of clumps, with single nuclei scattered in between. It is possible to estimate the deoxyribonucleic acid (DNA) content of single syncytial nuclei by microspectrophotometry, but not those in clumps, due to overlapping and lack of definiteness. It was considered that proteolytic enzymes could break up the clumps, but it was not known whether they would also damage the nuclei. In this investigation, papain and trypsin were used to break up the clumps, and their effect observed on nuclear size, shape and DNA content.

Placentae were obtained following 23 deliveries at term and the syncytial nuclei isolated by a modification of the method previously described¹. The method was modified by reacting at room temperature