

This Week's Citation Classic™

Löve Å & Löve D. Cytotaxonomical conspectus of the Icelandic flora.

Acta Horti Gotob. 20:65-291, 1956.

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This first complete cytotaxonomical review of any flora confirmed that the relationship of the Icelandic flora is mainly with the arctic-alpine plants of Siberia and Greenland-Canada. The about 550 species show weak differentiation into endemic races, probably because of the high frequency of established polyploids. [The SCI® indicates that this paper has been cited in over 130 publications—the most-cited paper from this journal.]

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September 10, 1984

"Our dissertation investigations at the University of Lund in Sweden just before and during World War II concerned the cytogenetics of sterility and sex determination in plants. These studies led to our interest in cytotaxonomy and cytogeobotany, fields initiated by Nordic botanists. During the war, we counted chromosome numbers in Swedish plants and compiled the first critical list of such numbers then known for the Nordic flora. That list and those that followed became the foundation for statistical studies of the geobotanical significance of polyploidy.¹ The studies confirmed suggestions by Hagerup² and Müntzing³ that the frequency of polyploids increases with latitude and altitude, supposedly because of expanded hardness. Naturally, such originality prompted *besserwissers* to explain this away and to claim that our use of numbers counted on foreign material was illegitimate. Convinced as we were of the constancy of chromosome numbers, we decided to meet the challenge by determining them in numerous samples of the complete Icelandic flora, of which the senior author then was compiling a modern manual.

"When we returned to Iceland after the war, we had prospects for plant breeding that were curtailed by officialdom, so we

used our time for the project mentioned. For five summers, we collected herbarium material and made more than 4,000 Karpechenko fixations of root-tips that were subsequently processed during the winters. We continued to compile our conspectus at Winnipeg, where we had emigrated in 1951. The manuscript was completed in 1955 and published in Sweden the following year, when we moved to the Université de Montréal. Later, at the University of Colorado and in California, the observations were used for four critical revisions of the Icelandic flora.⁴ The work has been widely cited probably because it reports novel observations on hundreds of species of an entire flora and a multitude of problems of cytological, geobotanical, and taxonomical interest. It is also cited because it confirmed that the application of the genetic paradigm to taxonomy safeguards the objective recognition of the basic biological categories and frees them from the commonly subjective intuition. Needless to say, our work did not support the complaints that prompted it.

"A similar approach has been successfully applied by others to the flora of the Queen Charlotte Islands⁵ and by us to the alpine flora of Mount Washington,⁶ the flora of Manitoba, and reviews of the central and northwest European, Slovenian, and arctic floras.⁷ Cytotaxonomists in Alsace, Italy, Poland, Portugal, Slovakia, and Spain are engaged in similar efforts, and in Siberia and Switzerland our program is being duplicated. In the US, however, where phenetic ideas still dominate over genetic in taxonomy, such work has not been encouraged by peer reviewers and the establishment for reasons that perhaps are the cause of the fact that a general manual or critical list of the entire flora is still missing, and all but a handful of local floras remain at the stage of 19th-century philosophy, contrary to those of Europe and the USSR. That, however, is a matter of more concern to the native botanists."

1. Löve Å & Löve D: The geobotanical significance of polyploidy. I. Polyploidy and latitude. *Portugaliae Acta Biol. Ser. A* 1949:273-352.
2. Hagerup O. Über Polyploidie in Beziehung zu Klima, Ökologie, und Phylogenie. *Hereditas* 16:19-40, 1931.
3. Müntzing A. The evolutionary significance of autopolyploidy. *Hereditas* 21:263-378, 1936. (Cited 75 times since 1955.)
4. Löve Å. *Flora of Iceland*. Reykjavik: Almenna Bókafélagid, 1983. 403 p.
5. Taylor R L & Mulligan G A. *Flora of the Queen Charlotte Islands. Part 2. Cytological aspects of the vascular plants*. Ottawa: Research Branch, Canada Department of Agriculture, 1968. 148 p.
6. Löve Å & Löve D. Cytotaxonomy of the alpine vascular plants of Mt. Washington. *Univ. Colorado Stud. Ser. Biol.* 24:1-74, 1966.
7., *Cytotaxonomical atlas of the arctic flora*. Vaduz. Liechtenstein: Cramer, 1975. 598 p.