

Bookreviews

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ARCTIC ADAPTATIONS IN PLANTS

Canada department of agriculture, Monograph No. 6, Ottawa 1972. Obtainable (free) from Information Division, Canada Dept. of Agriculture, Ottawa, Canada, K1A 0C7.

SAVILLE's inspiring booklet gives the author's "personal ideas and observations" on arctic adaptations in plants. The paper is divided into four parts: Introduction, dealing with the scope of the study, age and origin of the arctic flora, gradation of climate and characteristics of arctic environment important to plants. Part Two deals with flowering plants, their winter and summer survival and dispersal; Part Three with autotrophe cryptogames; Part Four with fungi. Conclusions form the last part of the paper.

The author shows that the arctic flora is relatively young, "a little more than 3,000,000 years" old, so that the complete elaboration of special arctic adaptations cannot be expected in such a brief time. Most of the species came to the Arctic from mountain habitats, so that they were already adapted to similar conditions.

Characteristic features of arctic life conditions are, according to SAVILLE, low winter and summer temperature, a short summer, strong wind, a long photoperiod, low light intensity, low nitrogen supply, low precipitation, simple population structure and low density. The author shows numerous examples of how arctic plants are adapted to the above conditions.

Discussing phytogeographical problems, most authors deal either with vascular plants, or with cryptogams. SAVILLE's paper has the advantage that it treats both vascular plants and cryptogams, including fungi, so that the results can be more universal.

SAVILLE's paper is valuable not only for botanists interested in the Arctic; it brings quite a few facts and suggestions of general interest.

It is clear that in such a study several points are open to discussion. Saville doubts the results of DAHL (1963) and HADAČ (1963) for example, concerning the dispersal of plants throughout the Arctic. Both these authors are of the opinion that plant dispersal in the Arctic goes mainly step by step, usually in whole communities, rarely in single individuals in long-distance dispersal. This opinion is corroborated by statistically significant data from different parts of the Arctic. SAVILLE, without analysing the above material, gives his view that plants in the Arctic spread freely over long distances by different means, showing their adaptation to wind and other kinds of transport. Nobody can deny that arctic plants have the means for long distance dispersal, but the question is whether they do establish themselves in distant regions. How can it be explained e.g. that *Salix polaris*, so common throughout Spitsbergen producing myriads of anemochorous seeds every season, does not occur in Greenland some few hundred kilometres distant? What explanation is there for so many narrow endemic species in *Taraxacum* or *Hieracium*, where wind dispersal of seeds is so obvious, and so few endemic species of *Carex* with relatively heavy seeds not likely often to be transported for long distances?

In the discussion of lichen distribution, the bipolar genus *Neuropogon*, occurring only in the Arctic and Antarctic, might be considered with respect to the age of the Arctic biota.

The species concept of SAVILLE is, in my opinion, fairly broad. He points for instance *Equisetum arvense* and *Cystopteris fragilis* (p. 60) as widespread from the high Arctic to temperate lowlands. In my experience, the *Equisetum arvense* complex is represented in the high Arctic by *E. boreale* BONG., and most of the high Arctic *Cystopteris* belongs to *C. Dickieana*, not to *C. fragilis*.

The paper of SAVILLE is very interesting (especially the original chapter on adaptations in *Uredineae*), and inspiring, and can be recommended to every botanist who is interested in phytogeography, ecology and the evolution of plants.

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