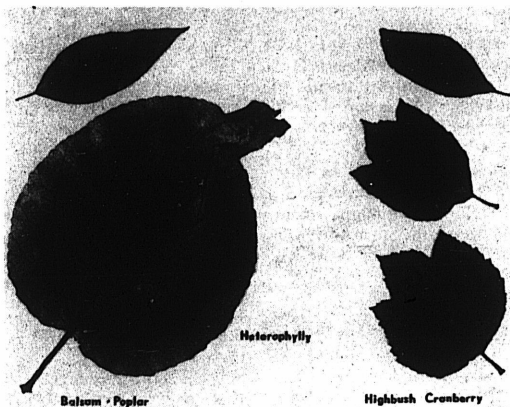


Alaska Science Forum



Leaf is a leaf . . .

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A leaf is a leaf . . . but not all leaves are created equally. An individual tree or shrub, regardless of its species, will exhibit variation in its leaves. The small-scale characteristics of leaf structure may differ leaf to leaf, and even the leaf size and shape may vary widely. The most apparent variations are those that occur from bottom to top of one year's new growth. Botanists even attach a word to this annual variation — one you are bound to remember: heterophylly.

Poplar leaves provide spectacular examples of heterophylly. In young poplar trees the leaves at the bottom of the shoot may be round and 6 to 7 inches in diameter while those at the top are usually oblong and only one or two inches wide. Highbush cranberry leaves show a similar but lesser variation.

The primary reasons for heterophylly are weather conditions at the time of leaf development and the type of shoot growth. In one type, called indeterminate shoot growth, the winter bud contains only some of the leaves that will grow on that shoot during the next year. The rest of the summer's leaves on that shoot form as the shoot develops.

In contrast, some trees have all the summer's leaves formed in miniature inside the winter bud. These trees are said to have determinate growth; examples are white and black spruce.

Alaskan trees with determinate growth display a burst of activity in June and complete their shoot growth by early July, although their leaves may continue to grow larger as the month progresses. Trees with indeterminate growth continue to grow until late July or early August. In this part of summer the leaves not found in the indeterminate shoot bud finally form.

Obviously there is a greater chance of wide variation in the leaves growing from those trees and shrubs such as poplar and highbush cranberry that have indeterminate shoot growth. Also, if one wishes to identify the variety of a tree by its leaves, one should be sure to gather leaves from the old growth. Otherwise the effects of heterophylly may make the identification difficult.

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