A New Way to Identify Trees

By Pat Peterson

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Michael Wojtech is certainly the first naturalist I have encountered to focus on identifying trees by looking at their bark. This is an obvious thing to want to do, especially in the northeast, where most trees spend half the year without the leaves or flowers, the basis of virtually all tree field guides. When Michael started his project, however, it soon became clear why no one had yet written a guide for identifying trees by their bark. Just one species of tree might have five different bark manifestations, from smooth and black, to vertically-cracked, to rectangular curling plates, back to smooth, and finally to vertically-ridged.

A Unique Key

But Michael persevered and, by using his understanding how bark develops to determine which features were important, he developed a systematic key, similar to the keys we use for identifying mushrooms. A feature of his key that I find especially interesting is that it accounts for the ambiguity that occurs for some species/feature combinations by continuing the key for that species on multiple paths. I wish more mushroom keys used this trick. The key also includes all the different bark manifestations for a species, which converge on the same description page where you can see all of the different stages. As you look up a tree, you can sometimes then see the younger stages on younger parts of the tree.

Bark Formation

In his talk, Michael gave us a very quick introduction to how bark forms, basically from the cambium, a thin growth layer that adds cells to both the wood of the tree, interior to the cambium, and to the bark of the tree, exterior to the cambium. As the bark cells migrate outward and die, they form the bark's outer protective "cork" layer. He explains all of this in more detail in his book, *Bark: A Field Guide to Trees of the Northeast*, published in 2011 by University Press of New England, www.upne.com. The details are important to understand how the keys were constructed, but in the limited time of his talk, Michael chose to focus, instead, on how to use the key.

Key Distinctions

The first distinction that Michael makes in his key is on the overall appearance of the bark, which he breaks out into seven categories: smooth and unbroken, peeling or curling horizontally, with visible lenticels (breathing pores), with vertical cracks, broken into vertical strips, broken into scales or plates, with ridges and furrows. To give us some practical experience making these judgments, he gave each table an unlabeled picture of bark and a visual key sheet for the seven categories. Although there were a couple of tricky cases, we gained some confidence that the judgments were not too hard to make. I

haven't tried to key a tree all the way down to species yet, but I think I will have a good chance with this new key.

Bark Ecology

For the last part of his talk, Michael talked about what he called Bark Ecology: how bark responds to external conditions and why it takes on the different forms that we observe. Two important, and sometimes competing, considerations are thermal regulation and energy production.

It surprised me to learn that in the Northeast, where the growing season is short and leaf energy production is limited, most deciduous trees generate extra energy in a green inner bark layer that contains chlorophyll. This process is most efficient where the bark is thin, in twigs and young branches, and, in the case of trees that never develop thick bark, like beech and birch, in the trunk itself.

For evergreen trees, which get energy from needles year-round, there is no advantage to thin bark, so their bark is always thick and well-insulating to protect them from temperature extremes and fluctuations. In contrast, thin-barked northern hardwoods have had to develop alternative thermal regulation strategies based on the ability of their light-colored bark to deflect harmful thermal radiation.

In Wojtech's book, there are many more examples of the ways in which trees respond to freeze/thaw cycles, fires, infestations, infections, mechanical damage, and more. Not only can you tell what kind of tree you are facing by looking at its bark, but you can often say something about its history, as well.