



***Acer saccharum* – Sugar Maple**
Jardin botanique de Montréal

THE SAPINDACEAE – MAPLES AND BUCKEYES

By Susan McDougall

There are compensations for the shortening of the days and the cooler temperatures of a northern autumn. Soon enough the leafy trees will become ghosts, their bare branches stretched upwards and outwards like so many pleading arms, gray beneath an equally muted sky. But before the inevitable drab time begins, the leaves are golden and the sun is out, and the sky — well, maybe it is my imagination, but the sky is colored the brightest blue of the year. I look out the window in anticipation and I am rewarded. In the middle of yard hundreds of foot-wide toothy leaves, surrendered to the ground by the Bigleaf



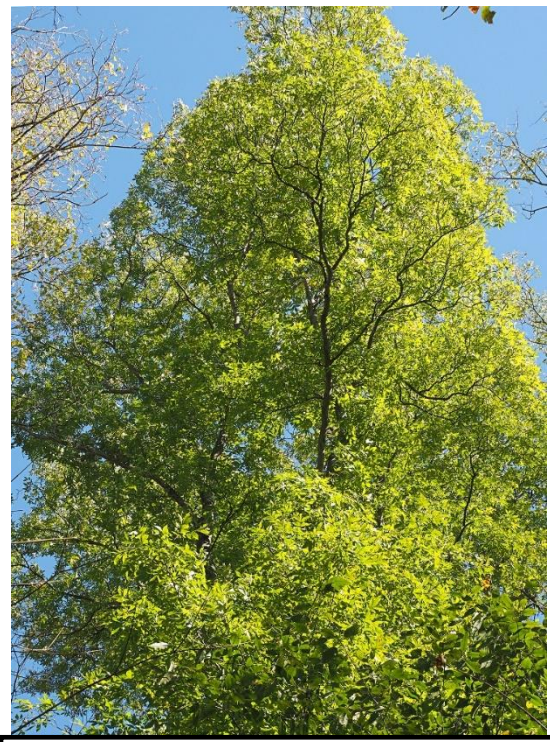
Autumn leaves — Bigleaf Maple (*Acer macrophyllum*)

Maple on the corner, have been raked into a tall pile. Their days of photosynthesis over, with their final brilliant display, the leaves have given their all. But the pile — ah, the pile lies waiting for a seven-year-old to send it scattering, one last time. There will be no objection from the father who raked the dusty leaves. This is an autumn ritual. Grabbing a jacket, I start for the yard.

Sixty degrees, sunshine, no wind, and the hail-bearing clouds pushed to the horizon. Weather-wise, this was promising to be our best day of the trip. Which wasn't saying a whole lot. October in the upper Midwest had been a most interesting experience this year.

But here we were in southwest Michigan, ready to experience an old forest, that rarest of landscapes. We were excited and pretty much alone. So far, few others were walking the flat trails of Newton Forest that day. Camera in hand, we started off.

Here was a who's who of midwestern trees, many of them large, nearly all with leaves transformed to warm hues in the autumn sun. Tulip trees, pale-trunked beeches, smaller plums, pawpaws with their long bright leaves, and, of course, the maples. There were two species that we could most easily identify — the stout, tall Black Maple (*Acer nigrum*), and the more common Sugar Maple (*Acer saccharum*). This was an especially



An old Black Maple (*Acer nigrum*)

good time of year for the Sugar Maple; it is this tree that transforms the midwestern and eastern forests from green to red.

The recent rain had subdued any dust on the trail, leaving a few puddles and a sparkle to the atmosphere. The snow and wind of previous days faded into memory. Ah, this is why we had come!

Here was a happy botanical foray into an unmolested woods, so when our path took us near the perimeter where a smaller forest of Sugar Maple grew, we were somewhat surprised to encounter a grid of cross-crossed stout ropes.

“Looks like some graduate student’s project, a study of – well, fungi, tree growth, bugs?”, said I.

“Uh-huh”, said David.

It was a large area, and the “plots” hardly appeared rectangular, but what did we know of the plan for a study. We walked on, a little intrigued, until we came to a bunch of looped roped, or rather gray tubes, and a spigot. Oh. Probably no students from the University were involved with this operation.

This was a small, automated maple syrup “farm.” Automated in the sense that clearly the faucets and valves were used for control of the tapping for sap each spring. It was not a place for the individual, but rather mass production. As such, the farm wasn’t unique at all. In recent decades most maple syrup aimed for the market and a large customer base is collected in this way. Gone are the days of walking across crusted snow, bringing your pick and hammer, and checking the flow of sap in a backyard maple.

Of course, the old-fashioned method isn’t completely gone, and each spring festivals in the

East and Midwest provide the opportunity to witness the tapping of the maple trees. At these events, you can buy syrup, enjoy the early days of spring, perhaps introduce your children to the gifts of this tree. And, for some groups of native peoples, maple sap was the source of an important food, and the trees a vital part of the culture.



Tubes for collecting sap in a Sugar Maple forest

The Ojibwe and the sacred maple

With her musical background Frances Densmore was well-suited to begin researching the historical role of music in the culture of the Ojibwe peoples of the Midwest. Growing up in Minnesota and attending the Oberlin Conservatory of Music, Densmore knew of other studies of Native American music. In time her interest in the marriage of plants and music in native cultures would lead to a lifelong career in which her educational background was important, but only as a start. In 1906, Densmore undertook her

first field work amongst the Ojibwe people of northern Minnesota and Ontario. For resources, she had a few studies from other researchers. Densmore would spend two decades amongst the Ojibwe, where, with her developing passion for the use of plants as food, medicine, and ritual, she would benefit greatly from the friendship of a few remarkable women.

In 1928, Densmore published a paper under the auspices of the Bureau of American Ethnology. It was entitled “Uses of Plants by the Chippewa Indians”. Less than a hundred years later, the material of the paper would be available as a book, *Strength of the Earth*. Within this book are pages of charts populated with native plant names and their uses. A good reference, but it is the text — the essays on a few exceptional plants so important to the Ojibwe way of life — that are absorbing. And amongst those, the history of the role of maple sugar as a necessary food is both educational and fascinating. Without the trees, life for the people would have been much impoverished, perhaps impossible.

Thus, the yearly tapping of the maple trees was both a social event, a time of festivities and getting together, and a vital activity to the well-being of the tribe. In spring, the people would gather a few belongings (although not much in the way of foodstuffs) and move to another camp, a permanent one with a well-chosen location. This was the place where one of two most important plant gathering events of the year would take place. Here the maple trees would yield their sap to a people who benefitted from the knowledge of countless generations. The processing, by women trained in the details of producing sugar, would provide the tribe with a supply for the coming year.

As with other food resources, maple trees were often honored by an offering of tobacco. The placement of small bundles of tobacco leaves at the base of the tree was an acknowledgement of the life-giving substance present that could be quite literally tapped from within. The tobacco was significant to many activities by the Ojibwe peoples. Probably originating in Central America, tobacco (Nicotiana rustica) had been harvested in the Midwest (and other places as well) for centuries, if not thousands of years. Its origins in a distant place (one common name is Aztec tobacco) pales in significance to the fact of its naturalization throughout temperate as well as warmer climates worldwide. This particular species was much more potent than the commercial tobacco (Nicotiana tabacum). When smoked, the tobacco was not always inhaled, but nevertheless its effects on the user were profound. It is perhaps the drug qualities that added to the significance of the plant. Recorded stories of tobacco relate its spiritual meaning and the importance of the continuance of its use as an offering. Today, a renewed interest in the spiritual meaning of Nicotiana rustica in the past has promoted both research and education that will ensure its future.

An offering of tobacco was an acknowledgement that maple sugar was not simply a luxurious treat for children and adults alike; it was an important part of the Ojibwe diet. Used as a seasoning for many prepared foods, maple sugar could be stored for long periods of time. Collection was a family and community event, and the camp where the work was done was permanent.

Consisting of a large lodge, “average” being nearly 20x20 feet, the central platform was where the work was performed. Utensils were stored there, and a long fire pit extended from one end of the lodge to the other. Above the fire the processing kettles were hung on a stout structure of poles laid at right

angles to each other and supported at each end. Here the business of processing would be carried on for about a month.

Most often the people traveled to the maple forest camp around the middle of March, their departure depending to some extent upon the condition of the lodge. Repairs might be necessary. To perform such work the men utilized another tree so important to the northern peoples. Birch bark rolls, carried by the women to the camp before tapping the trees began, and placed by the men, helped to secure the lodge, making it waterproof and comfortable in the late winter. Snow still covered the ground as the families began their yearly trek.

At the camp, utensils had been kept safe in a storehouse, as well as the many dishes used for collecting the sap and "makuks," which were used for storing the syrup. Some of these containers could hold a hundred pounds of sap. The kettles for processing were also kept in the sugar maple camp.

Each tree provided one or several tapping sites. The bark was cut about 3 feet above the ground, removed as a strip, and a wooden spike, made of elm, inserted. The sap flowed in the warmth of the day and was collected in stout vessels.

First heated slowly in small kettles, at night the syrup was boiled in large kettles, and strained in the morning. The kettles were cleaned, and the thickened syrup poured back in. Deer tallow was added to keep the sugar soft. When processed to the proper consistency, the syrup was transferred to a trough, pulverized, and poured into makuks.

Quickly-made candies were enjoyed by people of all ages, but the main use of the sugar was as a seasoning, long before the introduction and widespread use of salt. It was also dissolved for a summer drink and processed for medicinal use. Some of the sugar was stored at the lodge where it would keep for at least a year.

Native production of maple syrup continues in the twenty-first century. Its importance as a connection to the past is recognized by its continuance, but there are practical concerns involved as well. Ojibwe peoples are permitted by treaty to harvest outside the reservations, and today a few family-owned companies are involved with selling maple syrup to customers in the Midwest.

Europeans and the maple

As early as the sixteenth century European explorers of the North American continent savored the sweetness of maple sugar. Jacques Cartier, best known for his journey up the St. Lawrence River, benefitted from the knowledge of local peoples, and tasted the sap.

Cartier was an explorer whose purpose was to penetrate the continent, searching for riches more imaginary than real, as far as he could manage; he came to Canada (which he named) three times, none of which bestowed the wealth he and his sponsors so fervently sought. Europeans who followed came for a mixture of reasons, but were often there to stay, occupying the land. The story of the Pilgrims and their dependence on local indigenous people is well-known, but it was not only the cultivation of corn and other domesticated crops that benefitted the settlers. They also learned of the maple sap that could be processed into sweet syrup or a dense sugar. Soon the newcomers soon began to employ the method of drilling holes in the trees. Sap collecting was begun in spring as the trees responded to rising temperatures and longer days.

Early methods conformed to the basic method employed by the local Native Americans. The sap was collected in large buckets, boiled down, and processed. As in the past, the source was the forest itself, where large trees were valued and could be tapped with multiple holes. The process did not kill the tree and so the forest was preserved, perhaps without forethought or future acknowledgement. At that time, this source of sugar was important to the colonists; otherwise available only as an expensive import from the West Indies.

The season for extracting sap was short, as the “sugar bushes” (the farmer’s name for the trees) produced sap most abundantly when the temperature was about 40 degrees, following a freeze. Later in the season, even if the weather remained cold, the sap would not be as sweet. As with the practice of the Ojibwe in the use of a lodge where a fire could be built and sap boiled in large kettles, processing by the farmers was performed in a “sugar house”. Although it did not also serve as a residence, the method was similar, with firewood a necessary commodity — it takes about 40 gallons of sap to produce a gallon of maple syrup.

In time the process would become automated, but the source was unchanged. Tree selection and forest thinning were often employed, but the forest persisted, and there was motivation to keep it intact. Unfortunately, in the twenty-first century, a new agricultural, plantation-oriented idea, backed by an accidental discovery, may alter a method, that has persisted for so very long.

Tapping the Maple

First came the tapping, the pouring into an open kettle, the boiling, the buckets of syrup. Socialization, hard work, and gratitude. The Ojibwe offered tobacco, placing it near a tree. For the European settlers, sugar production was also local. In time, however, as the population grew and with it the scale of farming, a small industry developed. Modifications were tested and adopted for the purpose of decreasing boiling time, improving purity, and altering the flavor of the sugar or syrup. When cane sugar became more readily available, emphasis shifted to the syrup, where quick evaporation of the copious quantities of water in the sap was a goal achieved by the use of new types of pans, along with increased efforts to reduce contamination. Development of a “reverse-osmosis” machine would speed up sugar-making by extracting some of the water before boiling.

All that remained was the alteration of the collection method itself — the bucket. The replacement of this proven collector was perhaps inevitable, and by the 1970s plastic tubing furthered the automation process. Visit a producing maple plantation and the experience will be much like ours at Newton Woods. The sap will flow through tubes, activated with spigots. The tubes will the trees to a collecting house where evaporation will take place in open pans where processing time depends on desired concentration, carefully measured.

The maple syrup industry produces the condiment at the rate of approximately \$360 million dollars annually, with the province of Quebec accounting for nearly 90 percent of the total. Far less than many agricultural products but not insignificant by any means. In addition to the sugar maple, black maple and red maple are the most widely utilized trees, although just about any maple can be tapped.

If maple syrup production doesn’t fall into the category of “big business”, it is a viable business nonetheless, and one in which a small-scale farmer who owns a maple stand can participate. From a forest preservation standpoint, the benefits are many, and the image of the traditional New England

farm consisting of a forest and all its many inhabitants is both accurate and appealing. There are problems, of course. Squirrels chewing on tubes, the vicissitudes of weather, variations in sap production that are still incompletely understood. Despite such issues, in 2018 as the top supplier of maple syrup in the United States, the farms of Vermont alone produced 1.94 million gallons of syrup.

Most farmers cannot make a living on syrup production alone, but the demand does seem sufficient to ensure a future for the maple forests of New England. At least until recently. It isn't the nuisance of squirrels that spell an end. Rather it is an accidental discovery, coupled with well-developed agricultural methods in other "crops" geared towards mass production, that could spell the end of the maple syrup business as it is currently practiced. The maple plantation — for that is the only word that can accurately describe it — may spell the demise of the forest. In the world of the small farmer versus the large, only public awareness and consumption practices can determine the future.

In 2013, the news was released. The maple tree had given up a secret that no one had even suspected was there. A study into extraction methods had quite literally turned the maple upside down. Sap came from the ground, not the crown. As it is in many plant processes, gravity was defied. Why were we surprised?

Was the top of the old maple broken in a storm? Or had old age distorted the form of the mature tree? Whatever the reason, the clever researchers (well, maybe not so clever) noted that the maple still produced sap. Topless.

Soon a few maple saplings, minus their crowns, were tested. The sap flowed.

It didn't take long for the potential impact of this "discovery" on the maple syrup industry to be realized. More trees, younger trees, planted close together, would require less acreage. Maple plantations were the future, placed wherever the tiny trees might be induced to grow. No forests required.

I love farms, including the large. But I like the small ones the best. They represent something outside a world of "big." Maybe it is nostalgia, but the family farm myth holds great appeal. I believe this has been part of the reason for the continuation of the maple syrup industry for a long time, and the visits by thousands of people to maple festivals each year shows me that I am not alone. The syrup? There are competitors. The source? There is something with a link to the past and a connection to the present that no massive plantation, be it trees or corn, can emulate. What could be better than a forest with a tasty product, extracted by people adapted to a cold climate where maple trees thrive, a community of hardy souls with a connection to the past and a love of their land?

I suppose the new approach sounds good enough, and certainly the industry can and perhaps will spin it any way they want. Saplings are better adapted to climate change. Land is expensive, so increase in production (using saplings, not mature trees) means more money per acre. And now you can produce syrup outside its northern home. You don't have to invest as much land. Here is a future living, an opportunity to keep going.

You don't have to keep the big trees.....

The bark and the wood

In the West, the largest deciduous tree on the continent thrives in habitat that other trees might find too difficult. I have seen Bigleaf Maple on rocky slopes covered in late spring with winter snows;



***Acer macrophyllum* (Bigleaf Maple)**

Old and battered, but alive

alongside streams with seasonal inundation they can achieve great size, as is true in gaps between city lots where they may be less desirable. It's a tough old tree with lovely flowers and huge leaves. In autumn those leaves turn golden. In spring, as with the related Sugar Maple, the trees yield a tasty sap.

On the northern coast, however, it was the wood rather than the sap that was utilized by Native Americans. There were two maples available for the various products created for everyday and ceremonial use. A smaller tree or understory shrub, the Vine Maple (*Acer circinatum*) also served the people well.

Possibly the maple with the greatest latitudinal range (southern California to Alaska) Bigleaf Maple was used for a variety of articles, both utilitarian and decorative, amongst the Native Americans. In northern California, maple leaves were used as a bowl for cooking acorn bread while in the Pacific Northwest, the leaves were woven in to mats that provided a lining for

baskets used to cook salmon. The wood was utilized for a variety of products, from canoe paddles to gaming dice.

Red Maple (*Acer rubrum*) produces sap that can be processed into a sweet syrup, much like the Sugar Maple, but the seedlings can also be eaten, and the cooked inner bark was used as a thickening for bread. The seeds could also be boiled and eaten.

Maple bark was also used for a variety of purposes. Even in death, the rotten wood of Sugar Maple served for a dye and the inner bark of Red Maple could be processed into a deep purple hue. The bark was the source of a variety of medicines. Midwestern people made a tea from the inner bark of Sugar Maple as an aid to calming a cough and as an expectorant, and Red Maple bark was known as a treatment for sore eyes.

The story of the Canadian Flag



***Acer spicatum* – Mountain Maple**
Often a shrub but occasionally a tree. Taken
at Hawk Ridge, Minnesota

One of the pleasures of traveling to Canada for a tree lover is the chance to see many flagpoles, each bedecked with a maple-leaf themed flag. How many countries have chosen a leaf as a symbol, let alone a maple leaf? Except for the eastern part of the country, where European colonization began, maple trees are not even the most common. In terms of geographical range, the spruces and the pines dominate the forest. And in the east, only Mountain Maple (*Acer spicatum*) grows as far north as Newfoundland; the other maples are confined to the southern part of the provinces. In the west, Bigleaf Maple grows along the coast, and Boxelder (*Acer negundo*) penetrates the Midwest. But although tolerant of a range of temperatures and habitats unsuitable to many other species, maples are absent from most of the country.

Why then, the maple flag? Surprisingly, the flag does not date to the independence of Canada, but rather to the mid-twentieth century. The emblematic use of the maple leaf itself did occur in the nineteenth century, and in 1867 a song – “The Maple Leaf Forever” – was adopted as an anthem for English-speaking Canada. The leaf was placed on items as varied as coins and

badges for Canadian soldiers. The red-and-white motif apparently owes its origins to a British King (George V), who designated them as “officially” Canadian, so the leaf and the colors do have a long history in Canada. But not until 1965 was the maple leaf designated as the center of the first official flag for the country. Prior to this time, the country used that of the United Kingdom, also known as the Union Jack, a flag with a much older history.

Discussions of a national flag as they preceded its creation by many years. In 1895, Edward M. Chadwick recommended a flag with a maple leaf. Years later a committee worked on the idea, without finishing their work, and in 1946 another committee received 2600 submittals. In 1964, the proposals were whittled down to three designs.

With the design chosen, and the flag stitched, on January 28, 1965, Queen Elizabeth II proclaimed the flag official. Until that day, for over three hundred years, the flags of Canada were those of other countries.

Why, then, did Edward Chadwick envision a leaf as a “proper badge” for a flag? The history precedes his active years, for as early as 1836 a Frenchman used a maple for his newspaper logo. Somehow the maple had become a symbol for a country not yet officially designated and whose citizens would debate for many years the question of whether to have their own flag or to acknowledge the close ties with Great Britain (a country with as much a mercantile interest in Canada as an emotional one).

Perhaps it is the autumn color. Or the sweet syrup. Maybe it is impossible to envision a birch leaf on a flag, or a branch covered with spruce needles, strewn dark green with their prickly tips across the center. Or the beaver, which was important commercially but didn't last long. For me – well, I can't help but like a country that celebrates a tree on its flag as its special symbol of national identity.

Big beautiful trees



***Acer saccharum* (Sugar Maple)**
A big, beautiful tree at the Minnesota Landscape Arboretum

As with other native trees, the biggest of the maples have long since fallen to the ax, but the trees grow quickly, and fine specimens can be seen in places as varied as formal arboreta and old farms, city lots and county parks.

It is in autumn, however, that maples attract the most attention, and for good reason. A single large tree can make a memory, but a whole forest of brilliant color? That is an experience to which

you can return again and again. Even the shortest walk amongst the autumn maples is unforgettable.



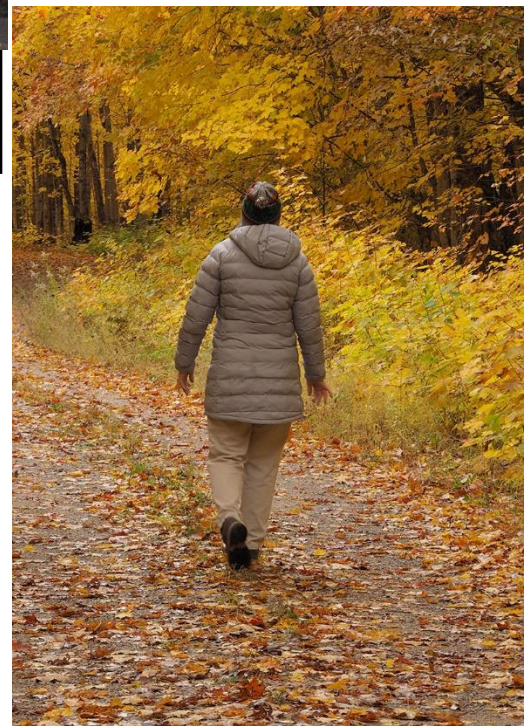
Acer saccharum
Minnesota Landscape Arboretum

The transformation of leaves from green to gold and red must trigger something in the human psyche, at least in the twenty-first century, as autumn color has become a vital part of the economy of the Midwest and the East. Particularly in New England, the annual sojourn of millions of people attests to the local claim that color is the richest here in the north. Here the Sugar Maples, dependably the most brilliant of all, grow in forests and yards alike, and other maples, such as the Red and the Black, contribute their own hues to the kaleidoscope of warm and varied shades.

The seeds are long dispersed, the last of the summer birds are winging their way south, and the furred animals are ready to

hibernate. But the humans have not hunkered down yet. Soon enough the leaves will drop to the ground, disintegrate, and with their disappearance, symbolize the fading memories of autumn, and the inexorable change of the seasons. Residents of colder climes will wrap their water lines and winterize their cars, while in somewhat warmer places, the rains will signal the end of the lingering days in autumn. It will be five months before the great maples are bedecked again, this time with the cool greens of spring. But in the meantime, the festivities have begun, and although it has been a year, the trees are once again the stars of the show. There may be discussion of how “good” the color is, and travelers may react to such reports, increasing the number of visitors and augmenting the local tourist business.

And come they do. In Vermont the number of visitors has increased yearly since 2007, and the dollar amount of the industry is measured at nearly two billion. Travelers spend even



Walk in an autumn forest

more in Massachusetts, and the economy of the most northerly state of Maine also benefits greatly from the maples of autumn. An Internet search reveals how important the changing of the leaves is to the region; websites devoted to the color of trees receive millions of visits this time of year.

The enthusiasts flock like migrating birds, some like the young there for the first time, others for repeat visits, leaving behind both their dollars and their appreciation as good memories for their hosts. They depart before a new reality for trees and humans has dropped upon the region like a great gray sheet, for with the shortening of days and the cooling of the air, everything shuts down. Free of the weight of



***Acer circinatum* (Vine maple) flowers**

leaves, twisted branches and twigs reach upwards like so many arms and fingers towards the dark sky; soon they will be bowed down beneath the weight of ice and snow. Photosynthesis has been abandoned; it just takes too much energy.

Winter's maple tree is thus quite different than that of summer and autumn, and the appreciation of its form must be left to those who live amongst the northern trees. In the west, the maples have also dropped their leaves, but their winter burden is much less than their eastern relatives and by the end of March they will respond to the spring days with a burst of flower color. In time, to the east the forest awakens once more, as the sap begins to flow, and the people rouse from their winter homes and trek through the snow to receive the annual gift from the awakening maples. Soon sugar festivals will welcome the coming of spring, and the maple leaves will unfurl once again.

Buckeyes (*Aesculus*)

Not long ago, the maples had their own family. Named "Aceraceae," one of its most distinguishing characteristics were leaves that were borne opposite on the branches. The seeds were enclosed within small "wings" (called samaras), structures that promoted ease of dispersal by the wind.

It was known that maples were closely related to the buckeyes (*Aesculus*). As it turns out, they are so closely related that botanical researches determined the two genera properly should be placed in the same family. Gone was the Aceraceae, and in its place was the Sapindaceae, in which both maples and buckeyes, along with many others, were now considered close enough kin to be included. The Sapindaceae (the common name is Soapberry, reflecting the use of some plants for making a lather) was already heavily populated.

Traditionally, the closeness or distance of the relationship between plants is was often determined by observable features of flower structures or seeds. Thus, the maple and the buckeye would demonstrate such familial affinity at least in part by the similarity of reproductive organs.

That was in the past. I think the resemblance is a little hard to see, at least in a macro sense. Here is a buckeye seed almost free of its leathery case, and a maple seed with its distinctive samaras.



Seed of *Aesculus californica* (California Buckeye)



***Acer circinatum* (Vine Maple) samaras and seeds**

The flowers aren't much help either, and the leaves – well, they are “simple” in the case of the maple, and “palmate” (several leaflets attached at the same point) for the buckeye. One similarity is the configuration of the leaves on the branch: both buckeyes and maples have “opposite” leaves. This, however, is not true for the family as a whole.

Prior to the move to the Sapindaceae family, the buckeyes also were placed in a family of their own, the Horse-Chestnuts, or Hippocastanaceae. The Horse-Chestnut species (*Aesculus hippocastanum*), a potentially large tree, is native to Europe, but the trees have been widely planted in North America and may be the “buckeye” with which people are most acquainted. Easily recognized by the large nuts that litter the ground in late summer and autumn, germination follows quickly, and soon small seedlings, their leaves prepared to receive the filtered sunlight, will dot the bare soil beneath the overarching branches of the parent.

Six related Buckeye species are native to North America; worldwide the count is 13 in the *Aesculus* genus.



***Aesculus pavia* (Red Buckeye)**

So why were the maples and buckeyes moved from families where they were the most numerous to one with more than 138 genera, a group that includes herbaceous plants and vines as well as tropical fruits? The Soapberry Family is also more widely represented in the tropics than in the more temperate climates. One on the continent, White Ironwood (*Hypelate trifoliata*), is an endangered small tree native to extreme southern Florida, far from most maples. What is the similarity?

In the past, plants were considered related based on morphological characteristics, and when identifying a plant using a botanical “key”, you are doing just that, even if a hand lens (or a microscope) is required to separate the plant in question from other candidates. Today, molecular studies have taken precedence over morphology as the tool for determining relationships between plants. New information of necessity often requires rewriting of a botanical key as different characteristics than those used previously are used to define relationships. At the very least, in the case of joining

two families and placing them in a third, the top level of the key would be modified. Thus, in a sense, morphology becomes fluid, a somewhat disconcerting reality for those accustomed to the “finality” of a keyed approach.

The organization responsible for coalescing and splitting plant families, genera, and species for the leafy plants is the Angiosperm Phylogeny Group (APG), an international consortium of institutes and professional taxonomists. Prior to molecular studies, much of the plant classification was based on the work of Arthur Cronquist of the New York Botanical Garden. In recent years, however, the APG began to apply the new research methods to the former system. As a result, some families were split, others lost members, and a few nearly disappeared altogether. Since the “lumping” of maples and buckeyes numerous studies have been conducted, but apparently one of the primary reasons for the reclassification was that they were closely related to a common ancestor.

Of course, not everyone agrees with the new sorting and it seems clear, as many taxonomists would agree, that morphologically the new members of the family seem to have little in common. Some researchers have even suggested that the maples and buckeyes should be placed in their own family, reflecting that commonality. The possible name? Xanthoceraceae.

Scientific names are often a mystery to someone without a Latin education. Although they are not exclusively of that language (quite often names reflect the person who identified the species), if you spend time with the names, trying to remember them (!), eventually some of the meanings begin to make sense. “*Macrophyllum*” (as in *Acer macrophyllum*) – “large leaf”. Yet one is still tempted to ask, even if only as a result of frustration – does all this naming brouhaha really matter? Aceraceae,

Sapindaceae, and now Xanthoceraceae? For the photographer, whenever name changes are acknowledged by authoritative organizations, renaming of photographs is in order. It can be a lot of work.

Thus, to the non-professional, perhaps it is more annoying than important, but from a scientific perspective, it matters very much. The search for botanical truth – the study of plants and their relationships – may not attract the attention of a black hole or the issue of carbon dioxide in our atmosphere, but the ongoing study of the ancient lineage of plants is as much a part of scientific enquiry as any other such endeavor. What does it ultimately signify? As with other questions of the past and present, that is often very difficult to answer. Experimentation, folklore inquiries, myths, traditional and modern medicine, agriculture, *genetic tinkering*, plant relationships — all of these are part of botanical science — and their relative importance, whether of a name indicating closeness or a use of a native plant, is a question we are not prepared to answer. So give me the new names, and I'll rename my photos. After all, the plants sequester carbon. What could be more important?

Don't Eat the Buckeyes!

Named for their resemblance to the eye of a male deer, buckeye seeds contain the chemical aesculin, a saponin, which, at sufficient concentration, can produce a negative impact on mammalian nervous systems. Although roasting the seeds removes much of the chemical, the process is not typically recommended. And it is not the seeds alone that are considered dangerous: other parts of the tree as well carry the toxins.

Although some Native American tribes are known to have consumed buckeye seeds, probably when other food was scarce; the detoxification process required leaching the saponins over several days. The result was a flour that could be used in a variety of foods.

Ground seeds could also be used for medicine; folklore around the seeds included the belief that carrying a buckeye seed in your pocket would cure arthritis. Some California tribes used the buckeye as a relief for hemorrhoids, and a poultice was applied to snakebite.

Today, the use of buckeye trees is promoted for everything from tea (made from the bark and good for a variety of problems, from the need to strengthen the veins to the treatment of swollen legs), to the curing of skin rashes with an ointment made from the seed. Given the trends in utilizing plants for a variety of human ailments (and the growth of the industry as well), it is to be expected that buckeyes will have entered this market.

Yet, by definition, modern use of plants is more likely to be one based on anecdote rather than of experience and scientific inquiry. Native Americans and peoples of other continents as well had thousands of years to acquire the knowledge of how to utilize native plants, including buckeyes. Medical practitioners often were specialized; they could and did take advantage of the benefits of their ancestor's and their own experiences. Specific plant concoctions would be discarded if they were ineffective, and the information retained and passed on. Medical practice was a combination of a dynamic present and the traditions of the past.

Ignorance is never bliss, and both experience and study are irreplaceable in the field of plant-based medical use. My concern is that the Internet, and other means of advertising (for so much of the Internet is precisely that) provides a forum for the lack of knowledge as much as it does experience and research. Selling snake oil wasn't all that different. This is not to say that all is unknown, because a great deal of knowledge has been acquired. But now this is big business, and as such truth and rigor may sometimes be at odds with market value.

It is no accident that a buckeye powder can stun a fish. It is chemistry, sometimes very complex chemistry. We need to know more.