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**Forestry and Natural Resources**  
 Know your Trees Series

## Red and White Mulberry in Indiana

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### Introduction

Do you know how to distinguish between our native red mulberry (*Morus rubra*), and the introduced white mulberry (*Morus alba*)? If you said no, don't feel bad; many folks do not. As is common with many exotics, white mulberry is a prolific fruit producer and aggressively colonizes open, sunny sites. In contrast, our more discriminating native red mulberry is rarely found away from the shade of mature, moist woods.

White mulberry is native to China. For thousands of years, it was cultivated as the preferred food source for the silk worm. The art of silk-making spread to Japan, then to India, and eventually into Europe.

Although earlier attempts to establish mulberry in the New World failed, it was introduced in the Long Island area in 1827, being touted by European sericulturists as the basis of a great commercial enterprise. Word spread quickly and mulberry was eagerly planted throughout the eastern United States. Costs of producing silk, however, were too great and the industry failed. Unfortunately, white mulberry flourished and spread quickly in its new environs. Birds and mammals relish mulberry fruit and helped spread the seeds through their feces.

### Identification

Red mulberry (Figure 1), our only native mulberry, is a tree often unnoticed, and commonly misidentified as white mulberry,



Figure 1. Red mulberry

or vice versa. Red mulberry is never common, but is found most often in the woods of southern Indiana where it prefers moist, wooded slopes, wood's edges, and shady roadways. It is very tolerant of shade and is usually found as a small, understory tree, but it can attain a height of 60 feet. When trees are heavily shaded, leaves are commonly 10 inches long.

White mulberry (Figure 2) on the other hand, is quite intolerant of shade, but other than that, it is much less particular about where it grows. It is more common in the northern half of Indiana and can be found in many urban settings, fence rows, and abandoned fields. It is truly a weedy species. White mulberry is considered a small tree, reaching only 40 feet in height. One confusing issue with white mulberry is the color of its fruit. There is a common misconception



Figure 2. White mulberry

that it is white, but that is rarely true. Most often it is red to purple when fully ripe.

Distinguishing between the two species can sometimes be troublesome, but there are several characteristics of each that are fairly consistent. Table 1 (back cover) is a quick reference guide to those differences. Keep in mind that mulberry species hybridize, and offspring can be difficult to categorize.

**Leaves.** Leaves occur in three general shapes in both species – entire, mitten (single lobed), and three-lobed. Red mulberry leaves (Figure 1) are usually larger (4-10 inches) than white (3-4 inches) (Figure 2). Red mulberry has dull, dark green leaves that are scabrous (rough) on top and usually lightly hairy beneath. Minor veins are numerous and obvious. Its margins are usually finely serrate when compared to those of white mulberry (Figure 3).

White mulberry leaves are bright green (usually) and shiny above (usually). If any hairs are present, they occur on the main veins beneath. The margins usually have larger, more rounded teeth. The main veins underneath are very prominent compared to those of red mulberry (Figure 4).

**Buds.** Buds are usually distinctly different in the two species and are available for at least



Figure 3. Typical leaf margins, red mulberry-L, white mulberry-R

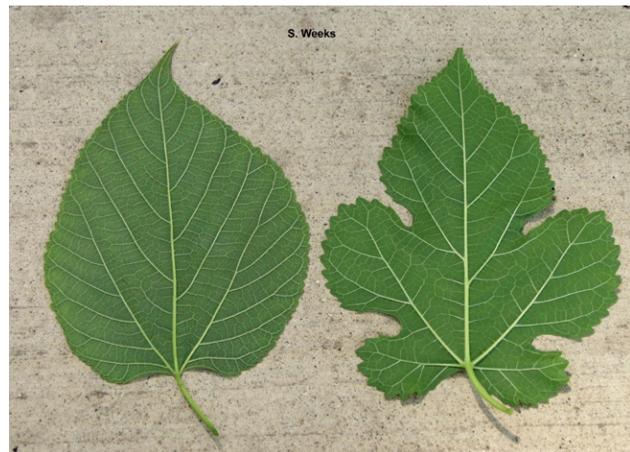


Figure 4. Underside of leaves, red mulberry-L, white mulberry-R

six months of the year (Figure 5). Red mulberry has larger, more flattened buds that often sit off-center on the twig; the margin of each scale has a black band. White mulberry buds are smaller and more domed in the middle, and they usually sit along the center of the twig. The tip of each white mulberry bud is short and needle sharp, and each bud scale has a brown band which is not necessarily on the margin. There is usually a color difference in the twigs of the two species as well. Red mulberry twigs are very pale tan, while those of white mulberry tend to be pinkish-brown. During the summer months, both exude milky sap when cut.



Figure 5. White mulberry-L, red mulberry-R

**Fruit.** The fruit of mulberry (Figure 6), technically known as a drupe; it is juicy, sweet, flavorful, and a delight of summer. It is relished by many birds and mammals, including humans. Red mulberry fruit is generally larger (>1 inch)



Figure 6. White mulberry-Top, red mulberry-Bottom

and sweeter than white ( $\frac{3}{4}$  inch), and since it is almost always found in shady, wooded areas where it produces a sparse fruit crop. Single fruits hang along the twig, in contrast to the clusters of abundant, axillary fruit usually present on white mulberry. Red mulberry fruit is always nearly black when ripe, while those of white mulberry may be white, red, or deep purple. Individuals that produce fruit that is white when ripe are very uncommon. Both species produce fruit in mid-June into July. Most trees produce fruit, but some are single sex (dioecious), with males producing no fruits and females needing proximate trees for pollination.

**Bark.** Red mulberry bark (Figure 7) is grayish with flattened, scaly ridges. If inner bark is exposed, it tends to be tan-colored. White mulberry bark has thick, braiding ridges that are tannish-brown. The yellowish inner bark is nearly always exposed between ridges.



Figure 7. White mulberry-Top, Red mulberry-Bottom



Figure 8. White mulberry form

**Form.** Open grown red mulberry trees are very uncommon, but they tend to have short trunks with large, low, spreading limbs – making fruit picking a breeze! White mulberry (Figure 8) is often a small, multi-branched tree that commonly has “witches-brooms” throughout its crown. White mulberry probably occurs in every county of Indiana, whereas red mulberry is difficult to find north of Indianapolis, likely because of a loss of woodland habitats and hybridization with the much more abundant white mulberry.



Figure 9. Natural range of red mulberry.

## Similar Species

Based on leaves, the tree species most closely resembling red mulberry (besides white mulberry) is **red or slippery elm** (*Ulmus rubra*) (Figure 10). It is a common woodland associate. Its leaves are alternately arranged, roughly the same size, dark green and dull, and have a rough texture. Two things to look for, however, are a lopsided leaf base and a doubly serrate margin on the elm. Red elm leaves are even more rough (scabrous) on the surface than red mulberry and have extremely short petioles.

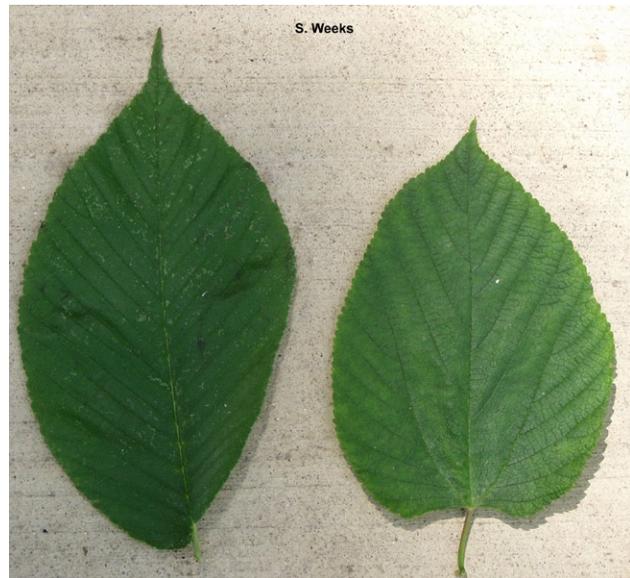


Figure 10. Red elm-L, red mulberry-R

**Sassafras** (*Sassafras albidum*) leaves (Figure 11) commonly have three shapes, especially on young trees. It can be found in association on woods edges with red mulberry. Sassafras leaves are pale green and smooth on the surface with a whitish underside. Its leaf margins are entire and when leaves are crushed, they give off a fresh, citrus odor.

Other introduced species of mulberry are occasionally found in the Midwest. **Black mulberry** (*Morus nigra*), an Asian species, is mainly found planted farther east; all of its characteristics are nearly identical to red mulberry. Numerous horticultural varieties of white mulberry have been planted in the United States, the most common species being *Morus alba* var. *tatarica*, **Russian mulberry**. It was



Figure 11. *Sassafras* leaves

mainly planted in the western states for use as shelter belts and wind breaks.

**Paper mulberry** (*Broussonetia papyrifera*) (Figure 12) is native to China and Japan, and has been planted irregularly in the southern states. It is hardy only as far north as extreme southern Indiana (Zone 6b). It is a member of the mulberry family (Moraceae), and has variable-shaped leaves that are rough to the touch. Notice its long leaf petioles compared to the *Morus* species. Its fruits are small, rounded “balls” attached directly to the twig. In shape, they look like a cross between a mulberry and Osage-orange fruit.



Figure 12. *Paper mulberry*

## Propagation

Fruit should be collected when ripe in June and July. Seeds can be extracted from the pulp by crushing the fruit by hand in a water bath. Viable seeds will usually sink and should be allowed to dry thoroughly if overwinter cold storage is desired. Otherwise, plant seeds immediately in good quality soil. Germination takes place within 14 days.

## Sources

Native species of trees and shrubs are difficult to purchase through nurseries, but of the nurseries that do offer red mulberry, the following URLs may be helpful:

- **Possibility Place Nursery**  
7548 W. Monee-Manhattan Rd., Monee, IL 60449  
[www.possibilityplace.com](http://www.possibilityplace.com)
- **Outback Nursery, Inc.**  
15280 – 110th St., South Hastings, MN 55033  
[www.outbacknursery.com](http://www.outbacknursery.com)
- **Forest Farm**  
990 Tetherow Rd., Williams, OR 97544-9599  
[www.forestfarm.com](http://www.forestfarm.com)
- **Mail-Order Natives**  
P.O. Box 9366, Lee, FL 32059  
[www.mailordernatives.com](http://www.mailordernatives.com)

## References

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- Flint, Harrison L. 1983. *Landscape Plants for Eastern North America*. John Wiley & Sons, New York. 677pp.
- Hardin, James W., Donald J. Leopold, and Fred M. White. 2001. *Harlow & Harrar's Textbook of Dendrology, 9th Edition*. McGraw Hill, Boston. 534pp.
- More, David, and John White. 2002. *The Illustrated Encyclopedia of Trees*. Timber Press, Portland, Oregon. 800pp.

<b>Table 1. Key features for separation of red mulberry and white mulberry</b>		
	<b>RED MULBERRY</b>	<b>WHITE MULBERRY</b>
Leaf size	4-10 inches	3-4 inches
Leaf margin	Smaller, more pointed serrations	Larger, rounded serrations (more tooth-like)
Leaf upper surface	Usually rough, dull with distinct network of small veins	Smooth (usually), shiny, few-veined
Leaf underside	Lightly hairy with pale main veins	Hairless except perhaps hairy main veins, which are substantial and white
Leaf color	Dark green	Bright green
Buds	Edge of each scale with a black band	Small; each scale with a brown band
Twigs	Pale tan	Pinkish-brown
Ripe fruit color	Purplish-black	White, red, purple
Bark	Grayish with more flattened, scaly ridges with tannish inner bark	Thick, tannish, braided ridges with yellowish, exposed inner bark

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