Examining Plant Fibers

Fiber identification contributes greatly to our understanding of where, when, and how a textile was made. In the Met's Textile Conservation lab, the best results are achieved by examining a fiber's longitudinal and cross-sectional morphology under a microscope.





Fibers examined under a compound microscope at 20x magnification.



Longitudinal morphology of fibers examined under a compound microscope at 400x magnification. Bast fibers' similar transversal nodes make it difficult to distinguish them from one another.



Cross-sectional morphology of mature fibers (including raw and mercerized cotton) examined under a compound microscope at 400x magnification. Bast fibers' distinctive characteristics are visible in the cross-sectional morphology of mature plants. The elliptical shape of cotton fibers becomes more uniform and round through mercerization.



Cross-sectional morphology of immature fibers examined under a compound microscope at 400x magnification. Bast fibers' cross-sectional morphology changes during the various stages of maturity. This makes identification difficult because an immature fiber may look similar to the mature fiber from a different plant species. For example, immature linen and hemp fibers can have morphology comparable to that of mature ramie fibers. Such examination is especially problematic for artifacts from Asia, where hemp and ramie coexist, and where hemp is often harvested in an immature state. Immature cotton has thin cell walls that create C and U shapes.