

## NOTES

**Host Occurrence of Eastern Mistletoe (*Phoradendron leucarpum*, Viscaceae) in Robertson County, Kentucky**—A survey of eastern mistletoe (*Phoradendron leucarpum*)-infested host trees in Robertson County, Kentucky, was conducted from 27 Dec 2002 to 6 Jan 2003. All paved roads and passable gravel roads in the county were traveled by vehicle. Host trees were identified and tallied by species, and the number of clumps of mistletoe were recorded. Voucher specimens were obtained for each representative host tree species by a extendable 12 m fiberglass linesman pole and then mounted, labeled, and deposited in the Berea College Herbarium (BEREA).

Four mistletoe studies have been published in Kentucky (1, 2, 3, 4). The only published report for mistletoe in Robertson County had been a sight record on *Juglans nigra* by Reed and Reed (1).

Robertson County is located in northeastern Kentucky (Figure 1). With 259 km<sup>2</sup> of land area, it is the smallest Kentucky county. Mount Olivet, the county seat, is centrally located at latitude 38°31'55" N and longitude 84°02'14" W. Robertson County is the state's least populous county, having 2266 people; 287 people reside in Mount Olivet according to the 2000 census (5).

The county is located entirely in the Hills of the Bluegrass ecoregion of the Interior Plateau Region of Kentucky (6). The hills consist of upland rolling topography with moderately steep slopes and broad ridges. Small ravines form seasonally intermittent streams leading to larger streams, e.g., North Fork Licking River and Licking River. Elevations in the county range from 170 m to 308 m. In Robertson County, Upper Ordovician limestone and shale bedrock belong to the Clays Ferry Formation, Lexington Limestone, Kope Formation, and Fairview Formation (7). The Eden-Nicholson-Lowell soil association is found throughout the Robertson County upland terrain (8).

Braun (9) classified forest vegetation as Western Mesophytic Forest in this region of the eastern deciduous forest; Küchler (10) placed northeastern Kentucky in the *Quercus-Carya* forest. I observed forest vegetation on upland limestone and shale hills as *Quercus alba-Carya* spp. forest with scattered large stands of *Juniperus virginiana* and a riparian forest of *Acer negundo-Platanus occidentalis-Acer saccharinum* in alluvial areas. A majority of the county is composed of pasturelands and agricultural crop-lands.

The continental climate in northeastern Kentucky is characterized by cool to cold winters and warm, humid summers with precipitation well distributed throughout the year (11). Climate data, 1977–2000, are from the Falmouth weather station in Pendleton County, 32 km west of Robertson County (12). Mean annual precipitation is 111 cm with the lowest precipitation, 7.2 cm, in October and the highest, 11.8 cm, in May and July. Mean annual temperature is 11.7°C with the mean lowest temperature, –1.6°C, in January and the highest temperature, 23.8°C,

in July. The mean growing season is 175 days with a range of 132 days to 211 days. The median first fall frost is 15 October and the last spring frost is 24 April (12).

*Phoradendron leucarpum* was found only on 45 trees from 7 host tree species in 6 families. *Juglans nigra* accounted for 23 host trees (51.1%). Other host trees were 10 *Ulmus americana* (22.2%), 6 *Robinia pseudoacacia* (13.4%), 3 *Acer saccharinum* (6.7%), and 1 each of *Gleditsia triacanthos*, *Fraxinus americana*, and *Prunus serotina* (6.6%). All host trees were situated east of Mount Olivet in the eastern half of the county (Figure 1). The sparse number of host trees in Robertson County was very significant when compared to other recent mistletoe studies in central and south central Kentucky, i.e., Lexington-Blue Grass Army Depot in Madison County with 1837 host trees (2), Rockcastle County with 3502 trees (3), and Garrard County with 1740 (4).

Low winter temperatures are the principal factor responsible for the sparse number of mistletoe-infested trees in Robertson County, e.g., in January 1994 the lowest temperature was –34.4°C and in February 1996 it was –22.1°C. My observations of host trees in mistletoe surveys showed extensive mistletoe die-back to the endophytic root system when extremely low temperatures have occurred. Spooner (13) found that eastern mistletoe reaches its northernmost distribution range in southern Ohio. He produced evidence that the main reason for the northern limits of eastern mistletoe corresponded to the mean minimum January temperature of –4.5°C. My extensive reconnaissance has shown that the incidence of mistletoe is sparse not only in Robertson County, but in all of the northern Kentucky counties within the Hills of the Bluegrass and Outer Bluegrass ecoregions. In several of these northern counties, I have observed eastern mistletoe only once or twice from one to three host tree species for the entire county, e.g., Bracken, Campbell, Lewis, Gallatin, Kenton, Owen, and Pendleton counties. Eastern mistletoe has not been observed in Grant County despite repeated searches.

Other mistletoe studies have documented the effects of low temperatures on spread and mortality of mistletoes. Garman (14) reported that severe winters destroyed much eastern mistletoe in Kentucky, but mistletoe gradually reappeared under more favorable temperatures in later years. Deam (15) observed the detrimental effects of low temperatures on eastern mistletoe and the restriction of the plant's Indiana range to the southern part of the state. Lightle (16) documented that low temperatures were factors in injury and mortality to three *Phoradendron* spp. in southern Arizona and New Mexico. Wagener (17) concluded that very low temperatures restricted two *Phoradendron* spp. to their present distribution limits in California and explained their absence in other parts of the hosts' range.

The dioecious characteristic of mistletoe may be another important factor in the overall sparse numbers of mis-



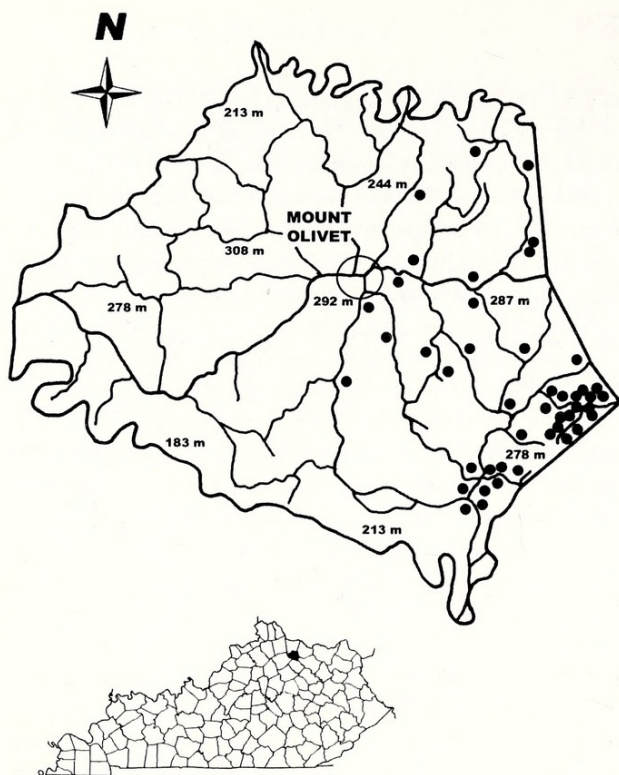


Figure 1. Robertson County, in northeastern Kentucky. The forty-five mistletoe-infested tree locations are indicated with solid circles.

tletoe-infested trees. The chance of mature fruits from a pistillate plant becoming dispersed by birds and established in new host trees with both sexes present in the near vicinity may be rare especially when there are so few mistletoe-infested trees in the county. Most the 45 host trees tended to be lightly infested; 19 trees had only a single clump, 7 trees had two clumps, and the remaining 19 trees had from 3 to 15 clumps. Thus, few trees had both staminate or pistillate plants in the same tree or nearby infested trees. Several host trees were isolated in upland pasturelands or around residences. Other mistletoe-infested trees of the same species along upland roads or fencerows tended to show an aggregated or clustered pattern (Figure 1).

LITERATURE CITED. (1) Reed, C.F., and P.G. Reed. 1951. Host distribution of mistletoe in Kentucky. *Castanea*

16:7–15. (2) Thompson, R.L. 1992. Host occurrence of *Phoradendron leucarpum* in the Lexington-Blue Grass Army Depot, Blue Grass Facility, Madison County, Kentucky. *Trans. Kentucky Acad. Sci.* 53:170–171. (3) Thompson, R.L., and F.D. Noe Jr. 2003. American mistletoe (*Phoradendron leucarpum*, Viscaceae) in Rockcastle County, Kentucky. *J. Kentucky Acad. Sci.* 64:29–35. (4) Thompson, R.L., and D.B. Poindexter. 2005. Host specificity of American mistletoe (*Phoradendron leucarpum*) in Garrard County, Kentucky. *J. Kentucky Acad. Sci.* 66:40–43. (5) Wikipedia, the free encyclopedia. 2005. Robertson County, Kentucky. [http://en.wikipedia.org/wiki/Robertson\\_County%2C\\_Kentucky](http://en.wikipedia.org/wiki/Robertson_County%2C_Kentucky). Accessed 23 Mar 2005. (6) Woods, A.J., J.M. Omerik, W.H. Martin, G.J. Pond, W.M. Andrews, S.M. Call, J.A. Comstock, and D.D. Taylor. 2002. Ecoregions of Kentucky (color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. (7) McDowell, R.C., G.J. Grabowski Jr., and S.L. Moore. Geologic map of Kentucky. U.S. Geological Survey, Washington, D.C. (8) Bailey, H.H., and J.H. Winsor. 1964. Kentucky soils. Univ. Kentucky Agric. Exper. Sta. Misc. 308. (9) Braun, E.L. 1950. Deciduous forests of eastern North America. Hafner Press, New York, NY. (10) Küchler, A.W. 1964. Manual to accompany the map of potential natural vegetation of the conterminous United States. *Am. Geogr. Soc. Spec. Bull.* 36. (11) Trewartha, G.T., and L.H. Horn. 1980. An introduction to climate. 5th ed. McGraw-Hill Book Co., New York, NY. (12) Kentucky Climate Center. 2001. The Kentucky Climate Center at Western Kentucky University Station Climate Summaries—Falmouth, Pendleton County station. <http://kyclim.wku.edu/cgi-bin/stations/152775>. Accessed 29 Mar 2005. (13) Spooner, D.M. 1983. The northern range of eastern mistletoe, *Phoradendron serotinum* (Viscaceae), and its status in Ohio. *Bull. Torrey Bot. Club* 110:489–493. (14) Garman, H. 1913. Woody plants of Kentucky. Univ. Kentucky Agric. Sta. Bull. 169:3–62. (15) Deam, C.C. 1924. Shrubs of Indiana. Indiana Department of Conservation, Bloomington, IN. (16) Lightle, P.C., D. Wiens, and F.G. Hawksworth. 1964. Low-temperature injury to *Phoradendron* in Arizona and New Mexico. *Southwest. Naturalist* 8:204–209. (17) Wagoner, W.W. 1957. The limitation of two leafy mistletoes of the genus *Phoradendron* by low temperatures. *Ecology* 38: 142–145.—**Ralph L. Thompson**, Herbarium, Department of Biology, Berea College, Berea, KY 40404.



Thompson, Ralph L. 2005. "Host Occurrence of Eastern Mistletoe (Phoradendron leucarpum, Viscaceae) in Robertson County, Kentucky." *Journal of the Kentucky Academy of Science* 66(2), 137–138.  
[https://doi.org/10.3101/1098-7096\(2006\)66\[137:hooemp\]2.0.co;2](https://doi.org/10.3101/1098-7096(2006)66[137:hooemp]2.0.co;2).

**View This Item Online:** <https://www.biodiversitylibrary.org/item/175710>

**DOI:** [https://doi.org/10.3101/1098-7096\(2006\)66\[137:hooemp\]2.0.co;2](https://doi.org/10.3101/1098-7096(2006)66[137:hooemp]2.0.co;2)

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/335697>

#### **Holding Institution**

Smithsonian Libraries and Archives

#### **Sponsored by**

Biodiversity Heritage Library

#### **Copyright & Reuse**

Copyright Status: Not in copyright. The BHL knows of no copyright restrictions on this item.  
Rights Holder: Kentucky Academy of Science

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.