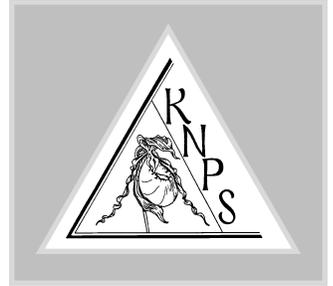


The Lady-Slipper

Kentucky Native Plant Society

Number 18:4

Winter 2003-04



IT'S MEMBERSHIP RENEWAL TIME!

*Renewal details and instructions are on **page 3**. Please use the enclosed envelope to return your renewal form and dues right away to:*

KNPS MEMBERSHIP • P.O. BOX 1152 • BEREA, KY 40403

A Message from the President:

HELLO EVERYONE! While some might think it would be an impossible task, I plan this message to be relatively brief. My wife Lela and I set up the KNPS display at the Fun Fall Festival at the Western Kentucky Botanical Gardens in Owensboro in October. Many thanks to Rita Jacobs and the host of volunteers that made the day a pleasant experience. The Botanical Gardens are a work in progress, but the support seems to be building and they're doing a great job as time and the availability of funds would allow. Of course, any time we have an opportunity to visit Owensboro, it also allows us to drop by Moonlite BBQ for dinner (one of our favorite restaurants) and visit the national champion sassafras tree listed in the National Register of Big Trees.

Our Fall meeting in November was a success at Bernheim Forest. Over 20 members attended an informative tour of part

of the grounds conducted by Hanna Gunter. They're doing some great things there. The weather was cooperative and we had a great little social gathering over lunch.

Elsewhere in the newsletter, you will see a synopsis and update on KNPS's Certification Program in Native Plant Studies. Two courses will begin next Spring at Northern Kentucky University. The course descriptions for these have also been included. We're excited to have the certification program start up again. The program was very successful at EKU and we look forward to a successful run at NKU. To all our members in the northern Kentucky/greater Cincinnati area and anyone else willing to travel a little distance, please keep this program in mind.

I hope each and every one of you had a safe and happy holiday season.

— Landon McKinney



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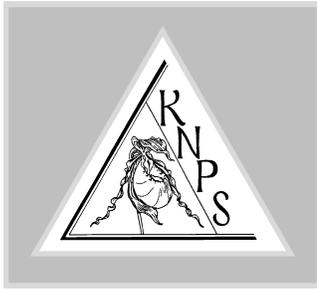
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BACK ISSUES of
The Lady-Slipper
and more — online at
<http://www.knps.org>

Joanne Grunwald



More than 20 KNPS members got together last November to spend a pleasant autumn day at Bernheim Arboretum and Research Forest in Clermont, Kentucky.



The Lady-Slipper

is intended to be published by the Kentucky Native Plant Society [IRC 501(c)(3)] in March, June, Sept., and Dec. Deadlines are the 15th of the prior months, but Editorial Committee members welcome article submissions at any time.

Send dues and inquiries about membership status to:

KNPS Membership, P.O. Box 1152, Berea, KY 40403

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KNPS CERTIFICATION PROGRAM IN NATIVE

THE KENTUCKY NATIVE PLANT SOCIETY has developed a series of classes dealing with various topics in native plant studies. These classes are designed for both members and non-members who have an interest in native plants but who have no background in botany or related sciences. They are community education courses aimed at enlightening the interested public on issues concerning all aspects of our native flora.

While the program allows interested people to become certified in native plant studies, it also allows those who do not wish to pursue certification to take courses on specific topics that they have an interest in.

PROGRAM SYNOPSIS

For those interested in certification, the program consists of the following six core, required courses:

- *Basic Botany*
- *Basic Plant Ecology*
- *Plant Taxonomy*
- *Plant Communities of Kentucky*
- *Kentucky Wildflowers (Fall or Spring)*
- *Kentucky Trees and Shrubs*

In addition to the six required courses, those interested in certification must complete at least three of the following special topic courses:

- *How to Know the Kentucky Mosses*
- *How to Know the Sedges of Kentucky*
- *Field Methods for Native Plant Research*
- *Field Geology*
- *Spring Wildflowers and Trees*
- *Aquatic Plants of Kentucky*
- *Kentucky Wildflower Keying*
- *Field Botany*
- *Gardening with Native Plants*
- *Rare Plant Conservation*

For anyone completing the program's requirements (six core and at least three special topic courses), a certificate in native plant studies will be awarded. A Special Achievement Certificate is also available for those who are willing to complete a research project as part of the certification process.

While courses are provided through university community education programs, they carry no college credit. They are generally offered at the rate of two courses

per semester of study. These are 12-hour courses and are generally taught over four consecutive weekends at three hours per weekend. Courses are not necessarily taught in any particular sequence and consequently, do not have to be taken in any particular sequence. While *Basic Botany* and *Basic Plant Ecology* are good courses to begin with, beginning with these is not a requirement.

As is the case with most, if not all, community education offerings, a standard fee will be charged and occasionally, additional charges for classroom texts and materials might be incurred.

The certification program and its courses are open to all who have an interest in our native flora including, but not limited to, members of all native plant society and garden club members in the Greater Cincinnati/Northern Kentucky/Southeastern Indiana area. While originally developed for Kentucky, all courses are equally applicable to Ohio and Indiana.

PROGRAM AVAILABILITY

The Certification Program in Native Plant Studies ran successfully for several years at Eastern Kentucky University. It is now being offered at Northern Kentucky University (Highland Heights campus) beginning with the Spring semester of 2004. The program will begin with two courses: **Basic Botany** taught by John Thieret during March and April, and **Basic Plant Ecology** taught by Landon McKinney during April and May. Time and registration details are provided at right above. Subsequent course offerings will be determined on an ongoing basis.

For this Spring's classes, printed or downloadable schedules with driving directions to the NKU Highland Heights campus are available through NKU's Community Connection office (see below). Those who have other questions about the certification program may contact—

NKU COMMUNITY CONNECTIONS

phone: (859) 572-5600

website: <http://nkuconnections.nku.edu>

email: connect@nku.edu

or—

LANDON MCKINNEY

phone: work (513) 825-7500

home (859) 283-5377

email: LMcKinney@eqm.com

PLANT STUDIES Revived....

COURSE DESCRIPTIONS

Basic Botany — This introduction to the world of plants includes the internal and external structure of plants, their growth, function, and reproduction, and the process and importance of photosynthesis. Classification of plants will also be discussed. It is for the amateur naturalist or plant enthusiast and is also part of the core requirement for the KNPS certification program in native plant studies. No background in botany or a related science is required.

Dates/time: Saturdays, 9 am–noon, March 20, 27, April 3 & 10

Location: NKU, Highland Heights campus,
Science Center (new), SC168

Class fee: \$79 plus materials fee TBD

Register by FEB. 21: Call 859-572-5600 or fax 859-572-5174

Basic Plant Ecology — This introduction to the ecology of plants includes environmental influences on plant distributions, competition between plants, plant adaptations, population biology, plant community structure and function, and succession. It is for the amateur naturalist or plant enthusiast and is also part of the core requirement for the KNPS certification program in native plant studies.



No background in botany or a related science is required.

Dates/time: Saturdays, 9 am–noon, April 17, 24, May 8 & 15

Location: NKU, Highland Heights campus,
Science Center (new), SC168

Class fee: \$79 plus materials fee TBD

Register by APRIL 9: Call 859-572-5600 or fax 859-572-5174



IT'S MEMBERSHIP RENEWAL TIME!

Please note the following information before completing the renewal form on **page 11**.
Use the enclosed envelope to return your completed form and dues right away to:

KNPS MEMBERSHIP • P.O. BOX 1152 • BEREA, KY 40403

FAQs...

Do I need to renew? — Your membership is paid through the year that is noted on your newsletter address label. For example, if your mailing label says “Expires 2003,” your membership was paid through December 2003 and you now need to renew. If your mailing label shows that your membership expires in December 2004 or beyond, or that you are a Lifetime or Exchange member, you do not need to renew. Of course, tax deductible gifts to support the work of the society are always welcome from any of our members.

What are the membership categories and rates? — There are only two membership categories: Annual memberships at a single address cost \$10, and Lifetime memberships at a single address cost \$150. We no longer have both individual and family memberships — just members. Please note that you may renew for up to two years at the current \$10 per year rate. If you remit more than \$20 for your annual membership, you will be renewed for two years and the additional funds will be accounted for as a gift.

I joined KNPS in the middle of 2003. When does my membership expire? — Annual memberships are for the January–December calendar year. However, if you became a new member after June 30, your first annual membership will not expire until the end of December in the following year. For example, if you joined in July 2003, your first “annual” membership will run through December 2004.

Where should I send my completed renewal form, and whom should I contact if I have more questions? — Complete the form on **page 11**, clip it out or copy it, and send it to Kathleen Jones, the KNPS treasurer, at the address above. If you have more questions, please contact Kathleen at the same address.

Thank you.

Professor Willem Meijer – 1923–2003

by Carol and Jerry Baskin
Department of Biology, University of Kentucky

This Memorial Resolution was presented to the University of Kentucky Senate at its December 8, 2003 meeting.

WILLEM MEIJER, Emeritus Professor of Biology, died of heart failure at the age of 80 on October 22, 2003 in Lexington, Kentucky. He was born in The Hague, The Netherlands in 1923 and received his Ph.D. from the University of Amsterdam in 1951. From 1951 to 1968, Dr. Meijer worked as a botanist in Java, West Sumatra, and North Borneo. He joined the faculty of the then Botany Department at the University of Kentucky as an Associate Professor in 1968, became a Full Professor in 1983, and retired in 1993.

His interest in natural history began in the early 1930's, and in 1939 he published his first paper, which was an essay on some bryophytes from near Amsterdam. During his early explorations of the coastal dunes, moist meadows, fens, and wetlands of The Netherlands, he developed a strong interest in plant collecting and identification and in nature conservation. He was talking about these passions on the day of his death.

His work in Indonesia involved botanical explorations (part of which are chronicled in *Flora Malesiana*, Series I, Vol. 5, pp. 68–70), teaching, and development of herbaria. His research on bryophytes and other plants not only resulted in many publications but also thousands of specimens (over 14,000 from Indonesia) that he deposited in various herbaria, thus making the material available for study by future generations of botanists. He was a well-recognized authority on bryophytes, Dipterocarpaceae (a family in southeast Asian rain forests with many valuable timber trees), and *Rafflesia* (a parasitic plant with the world's largest flower).

At the University of Kentucky, Professor Meijer enjoyed studying the flora and vegetation of Kentucky and continuing his studies on tropical species. He was a challenging teacher for many unsuspecting, not-so-well-traveled undergraduates, who had no clue as to what they should do with a class handout written in German. He was avid about

taking students on fieldtrips and made a lasting impression (for the better) on many of them. The students quickly learned, however, that it was best if one of them drove during fieldtrips, thereby allowing the Professor to devote full attention to expounding on the plants seen along the way. He organized a "protest" and saved the Mathews Garden from becoming a grassy lawn. Then, he worked to increase the number of native species in the garden, making it a valuable teaching resource. Dr. Meijer served as the major professor for eight M.S. and two Ph.D. students.

Professor Meijer's botanical travels took him not only to Indonesia but also to Ceylon, Pakistan, Celebes, West Papua New Guinea, west Africa, Venezuela, and Panama. He was a Research Associate of the Missouri Botanical Garden in St. Louis and was involved in their tropical research efforts in southeast Asia and Latin America.

Willem had a keen interest in people, places, and natural history. He was constantly trying to motivate people to do things for the sake of conservation, including arguing with government officials in Indonesia about logging the rain forests and urging a Kentucky citizen to propagate thousands of oak seedlings for a restoration project.

Sometimes his demands really got on people's nerves; however, no one held a grudge against this innocent scholar. People greatly respected his wealth of knowledge and realized that he was a kind and caring person, who was deeply concerned about saving the world's biota, especially plants. He worried out loud on many occasions about the death of orangutans as a result of the destruction of rain forests in southeast Asia. He was a "friend" of all plants and hated the idea that anyone would spray herbicides—even to kill dandelions in the lawn—and was not shy about speaking against this practice. Dr. Meijer touched many lives, and his sense of humor and his passion for plants and nature conservation will not be forgotten.

Professor Meijer is survived by a daughter, Frederica, in Amsterdam, a son, Johan, and two granddaughters in Portland, Oregon, and a son, George, and two grandsons in Copenhagen, Denmark. I ask that this resolution be made a part of the minutes of the University Senate and that a copy be sent to Professor Meijer's family. 



Was Dr. Meijer the crown prince of exotic aliens? He *did* look good in *Ailanthus*.
Photographer unknown.

Dr. Meijer

by Jim Conrad

IT'S FUNNY, but I can't walk past a Black Walnut tree without thinking of my former major professor at the University of Kentucky, Dr. Willem Meijer. He was a Dutchman with a fine accent. He always called me Yim. He possessed a wry and irrepressible sense of humor that usually got him in trouble wherever he went. In Dendrology Class

each semester he'd get lots of mileage from referring to pine trees with his European pronunciation of the pines' genus name, which is *Pinus*. Americans rhyme "Pinus" with "minus," but Europeans call it the way it looks. "Girls, just look at that lovely *Pinus* outside the window," he'd say. He also made sure we all knew why Black Walnuts belong to the genus *Juglans*. That name is derived from the Latin expression "Jovis glans,"

which means, approximately, "God Jupiter's balls."

Dr. Meijer has been a huge impact in my life. I'm not sure that with my dissident views on botany and life in general I'd have acquired my degree with a less heretical, more straight-laced prof.

Dr. Meijer died this Wednesday at age 80, in Lexington. Friday, when I went gathering Jupiter's balls, it was almost as if I could hear his high

The Power of Plants

These excerpts from Dr. Meijer's 1989 BIO 106 Lecture #2 notes were compiled by Scott Gleeson, UK Department of Biology.

...THE MORE YOUNG STUDENTS become aware of the fascination of our environment and history, the more happy they will be in life and the less they will crave for misuse of substances and other human follies....

Our minds and spirits feed on plants. You have to be very hungry in time of war to realize how low in spirit our body becomes without food or when we lose the taste for it, like with patients undergoing radiation therapy.... We needed a severe drought last year to realize how dependant we are and how necessary it is to study plants which can survive in dry climates....

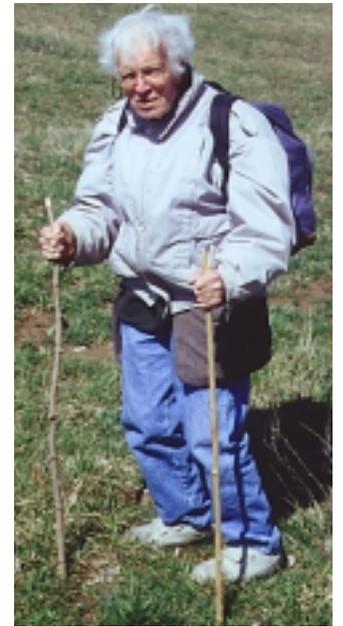
Laboratory botany and textbooks start to forget how the life of whole plants reflect the seasons.... The local Indians darned well had to collect in time the grains of amaranths, lambsquarters, canarygrass and the acorns, hickories, walnuts, ragweed and sumpweed to store them for the winter which they spent in their rockhouses in the hills around the Appalachian mountains. They knew which plants had good fibers to make cordage, baskets and covers against the cold.... By trial and error they found out about the medical potentials of plants of which we now can isolate bioactive compounds, even some cures for skin cancer, like mayapple.

When I roamed through tropical forests we always had to look for rivers and opportunities to catch fish while spending no time on big game hunting for our protein resources. I even learned how to eat snails, and their remnants will be found in our campsites by future archaeologists....

Now in our society with a weak educational system and less environmental ethics of a more technological post-industrial society, plants [no] longer have the same central place in people's daily life as during our early history. All we know is that it all comes from the supermarket. Are [we] becoming less curious, numbed by rote memorizing, oversaturated with TV entertainment and the pursuit of grades and point averages instead of increasing our facilities for inquiry and research?? Could other more creative nations...take over



Dr. Meijer, one of the founders of the KNPS, led many field-trips on its behalf and was an unignorable presence on many others. He never could resist an opportunity to teach and just a few weeks before his death he arranged for a trip to teach about the globally threatened habitat represented by Griffith Woods in Harrison Co. Photos by Jim Lempke.



in case we continue on this path?? How many of you keep informed reading news and semipopular science and geography magazines?? How many sell your books as soon as a semester is over or even do not save notes and handouts??

What can we learn further about other cultures and the history of economic botany which might be relevant to our present problems? To me the most important is traditional feelings of respect for life, animals as well as plants, are everywhere still the best safeguards against misuse of plant resources. I have seen in Africa, Venezuela, Bangi Island, in India and Ceylon—now Sri Lanka—around Kinabalu and on Bali, Java and Sumatra how traditional agriculture and religion and veneration of plants can be decisive....

Plants [in] the long run [are] our only natural resources, for fuels, fibers, clothing. We will need to become more vegetarian and better ecologists, shift with the climates, try to preserve the biodiversity of spaceship earth. Above all we need more fair use of the resources and do away with our throwaway mentality. The US [is] ok with population control but very bad with energy efficiency and waste control, air pollution and market controls in agriculture and forestry.

The goal of all education should be to motivate people to work together, to bridle human greed and violence and to stop all that spraying and poisoning, to become more vegetarian, to try organic farming and biological pest control. There is a role for biology and botany in all of this. The best, if you want to be active on these fronts, is to study biology and law and business or to combine pharmacy and/or medicine with any of those fields. Do not come here only to get a grade and get rich regardless of what the rest of the world does. If you are forced to study a subject you may not like, find a book that might get you interested.... You are not bad off with some real sense of wonder for the great richness and beauty and multiple potentials of plant life. The world is still rich and it becomes smaller and smaller and closer to the rest of the universe. We now can really study planet earth and its rich cornucopia of plant life.

cackling laugh in the dry leaves beneath the tree.



Jim Conrad's remembrance first appeared in the Oct. 26, 2003 issue of Natchez Naturalist Newsletter (www.backyardnature.net).

You can post your own remembrance and see others from Dr. Meijer's worldwide friends, students, and colleagues at www.legacy.com

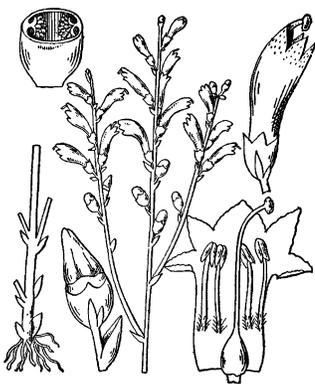


Kentucky Plants with Unusual “Lifestyles” — Part I, PARASITES

by Ron Jones



Field Dodder
(*Cuscuta arvensis*)



Beechdrops
(*Epifagus virginiana*)



American Squawroot
(*Conopholis americana*)

THE VAST MAJORITY of vascular plants in Kentucky exhibit a “typical” life history, that is, they are rooted in the soil and have green above-ground parts that carry on photosynthesis. Thus, the typical plant is composed of roots, stems, and leaves, and it obtains all the necessities of life from sunlight, air, water, and soil nutrients. A number of Kentucky plants, however, exhibit atypical forms or life histories. Among these are Kentucky’s carnivorous plants, epiphytes, hydrophytes, parasites, and saprophytes. In this and subsequent articles, these atypical types of plants will be described. The first to be treated are the parasitic plants.

PARASITIC PLANTS

Parasitic plants are those plants that obtain water and nutrients from a host plant. The relationship is beneficial for the parasite and generally detrimental to the host, but only rarely fatal. There are two basic types of plant parasites — *holoparasites*, which lack chlorophyll and have an obligatory relationship with their hosts (they obtain food, water and minerals); and *hemiparasites*, which contain chlorophyll and have the ability to make their own food, but obtain water and minerals from their hosts. In order to link their vascular systems to the xylem and phloem of the host, the parasite produces special root-like organs, the haustoria.

Holoparasites —

Holoparasites in Kentucky occur in two families — the dodder family (Cuscutaceae) and the broomrape family (Orobanchaceae). The Cuscutaceae is represented in Kentucky by nine species, and all are stem parasites. These plants, yellow to orange twining annual herbs, are parasitic on a wide variety of plants, including shrubs and herbs. Some species are important as pests on legume crops. *Cuscuta* seeds germinate in the soil, and the growing seedling tip must then make contact with a stem of an appropriate host. As the dodder stem tip wraps around the host stem, haustoria develop, the roots die, and the dodder loses contact with the soil. These plants sometimes form dense twining masses over fields of herbs or cultivated plants.

The members of the Orobanchaceae are parasitic on the roots of deciduous trees, and include beechdrops (*Epifagus virginiana*), broomrapes (*Orobanche* spp.), and squawroot (*Conopholis americana*). These plants

produce very small seeds that are washed deep into the soil and into the vicinity of the host roots. Upon receiving a chemical signal from the host, the seeds germinate, and the root tip forms a disk-like attachment to the host. The root tip then pushes through the host tissues, establishing a connection to the vascular system.

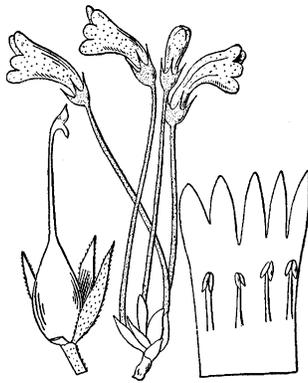
Three species of *Orobanche* have been recorded in Kentucky — one-flowered broomrape (*O. uniflora*), which is infrequent in the state; prairie broomrape (*O. ludoviciana*), which is no longer known to occur in the state (considered Historical); and branching broomrape (*O. ramosa*), an introduced species from Eurasia, which is now a rare parasite of cultivated plants (tobacco, tomato, and hemp). The first serious outbreak of *O. ramosa* in the United States occurred in Kentucky, when it attacked hemp crops in the early 20th century and actually threatened the survival of the industry in the state.

Hemiparasites —

Both woody and herbaceous hemiparasites occur in Kentucky. There are three woody species in two families — American mistletoe (*Phoradendron leucarpum*) in the Viscaceae; and conjuror’s-nut (*Nestronia umbellula*) and buffalo-nut (*Pyralia pubera*) in the Santalaceae. Another parasitic member of the Santalaceae, bastard toad-flax (*Commandra umbellata*) is herbaceous, as are all the hemiparasitic members of the Scrophulariaceae — *Aureolaria* spp., *Agalinis* spp., *Buchnera americana*, *Castilleja coccinea*, *Dasistoma macrophylla*, *Melampyrum lineare*, *Pedicularis* spp., *Schwalbea americana*, and *Tomanthera auriculata*.

With the exception of mistletoe, all of the above-listed hemiparasites are root parasites on a variety of native plants. American mistletoe, which is a stem parasite, is considered to be a poisonous plant, but is widely sold for Christmas decorations. A shrubby plant with opposite leaves, it produces a sticky berry that is heavily sought after by birds, which disperse the fruits from tree to tree. The fruits are mostly likely to attach to trees with rough bark, such as black walnut, black cherry, American elm, and blackgum. Upon germination, the seedling root tip then penetrates the bark in a similar manner to that described above for root parasites.





One-flowered Broomrape
(*Orobanche uniflora*)



Conjuror's-nut
(*Nestronia umbellulata*)



Buffalo-nut
(*Pyrularia pubera*)



Bluehearts
(*Buchnera americana*)

The MISTLETOES

by David Taylor

AS AUTUMN FADES INTO WINTER, dark green clumps perched in trees along roads and fencerows, stand out once again. Some trees, especially black cherry, now exhibit gnarled or stub branches, the telltale sign of a current or past infestation, even if the plant is unseen. Birds may be seen plucking white berries from the clumps, and occasionally a person may be seen scouting trees from which to gather some at a later date. The object of attention?—mistletoe.

In Kentucky and neighboring states, we think of the thick-leaved, usually dark green plant we see growing in hardwood trees in towns and along country roads. This is only one of many species of plants known as mistletoe. Before returning to the mistletoe familiar to us, we will take a survey of the mistletoes.

MISTLETOE FAMILIES

The plants commonly known as mistletoes belong to one of two families, the Loranthaceae and the Viscaceae. Two other less familiar families of 'mistletoes' are the Eremolepidaceae and the Misodendraceae. All have in common a *hemiparasitic* relationship with a host plant, almost always a woody plant. Hemiparasites derive water, minerals, and occasionally food (sugars) from the host plant, but are photosynthetic and produce at least part of their own food. The lesser-known families are briefly mentioned first.

The **Eremolepidaceae** family is variously placed in the Loranthaceae or the Santalaceae depending on the author (see Watson and Dallwitz 1992–2003, Nickrent, 2003a). It is a small family of 4 genera with 12 species. They are distributed in New World tropics. All are small shrubs, with attachments made to stems of woody plants. They may have well developed leaves or scale-like leaves. Flowers are somewhat showy or small and inconspicuous. Seeds form in berries in which they are coated with viscous material. Seeds are largely bird-dispersed. They are found the West Indies (*Antidaphne*, *Eubracion*, *Eremolepis*—= *Antidaphne* in some views, see W³ Tropicos 2003) and South America (*Antidaphne*, *Eubracion*, *Lepidoceras*).

The **Misodendraceae** is a small family of one genus (*Myzodendron*) and 11 species.



"Mistletoe on Locust, Stephensport, Kentucky" (Breckinridge Co.)—a glass lantern slide from American Environmental Photographs, 1891–1936, [#AEP-KYS9], Department of Special Collections, University of Chicago Library.

They are distributed in the New World tropics, southwest South America, and Antarctica. All are small shrubs with attachments made to stems of *Notofagus*, southern beech (Nickrent 2003). Leaves are either scale leaves or well developed. Flowers are mostly small and inconspicuous. The fruit is dry and seeds are wind-dispersed.

The **Loranthaceae** was once considered a large diverse family, but in the last 40 years, a subset of the family has been recognized as the Viscaceae. The Loranthaceae in the strict sense is a tropical family inhabiting both the Old and New World tropics, but with species found in temperate regions. About 70 genera and over 900 species are known in the family ranging in habit from trees (*Nuytsia*) to shrubs to lianas (Watson and Dallwitz 1992–2003). Most genera in the family and all of the mistletoes make their parasitic attachments to stems and branches of woody plants, but a few genera attach to roots. The plants are generally evergreen and have either normal or scale leaves. Flowers tend to be large and showy. Fruits are usually berries and most seeds are covered with a viscous coating. Seeds are primarily bird-dispersed. North (Central) American genera include *Cladocolea*, *Struthanthus*, *Psittacanthus*, and *Dendropemon*.

(Continued on page 8)

The MISTLETOES (continued)

Cladocolea is a poorly understood genus consisting of about 23 mostly rare species, predominately found in central and southern Mexico. These species occur as shrubs or nearly vines in both hardwoods and conifers.

Struthanthus consists of 50–60 species occurring from northern Mexico (very close to the U.S.) to southern South America. This too is a difficult group of species and many are rare. They occur primarily in hardwoods, but also infect conifers.

Psittacanthus (parrot flower) is found throughout the New World tropics, as far north as central Mexico (Geils, et al. 2002). Most members of this genus have large, showy—often red or orange—flowers (see a photograph at Nickrent 2003).

Dendropemon occurs further south in Central America and South America.

Dendropemon is also known from the West Indies with some species endemic to the region (see Correll and Correll 1982). The species in these latter two genera tend to be rare, found in small scattered patches. Individual plants of these genera are usually vine-like or small shrubs. They usually occur in hardwoods but are sometimes found in conifers and sometimes in enough concentration to cause economic damage to timberlands.

The **Viscaceae** is the family of ‘true’ mistletoes. The family consists of 7 genera and about 450 species. The family is dispersed in temperate and tropical climates of both the Old and New Worlds, but is best developed in the tropics. All species are shrubs with attachments to branches and stems of woody plants. Leaves are leathery to herbaceous or scale-like. Flowers tend to be small and inconspicuous. Seeds are produced in a berry filled with viscous tissue (Watson and Dallwitz 1992–2003). Seeds are primarily bird-dispersed. North American genera are *Arceuthobium* (also occurs in Europe and Asia) and *Phoradendron*. *Viscum* occurs in Europe and has been introduced into California and Canada (Geils et al. 2002).

Phoradendron (“tree thief”) consists of about 200 species scattered through the temperate and tropical regions of the New World. Most of its distribution is in Mexico and Central America. About 12 species are found in the U.S. and one, *Phoradendron leucarpum* (also seen in recent literature as *P. serotinum* and in older literature as *P. flavescens*), in the southeast U.S. including Kentucky. Species of *Phoradendron* tend to be dark green, although ailing and dying plants may be light green, and a few are reddish. Most have typical, but leathery leaves. A few have reduced leaves. Plants are either monoecious or dioecious. They produce small inconspicuous flowers and a small white, pink or red berry, which contains 1–2 seeds and a sticky material, viscin, by which the seeds stick to tree limbs. Birds are known to spread the seeds by wiping beaks and feet clean of the viscin and attached seed on limbs. Gravity also disperses seeds, usually with the same tree. Individual plants may reach more than a meter across, but usually are about 1/3 meter across.

The genus is most frequent in hardwood trees, especially (in the U.S.) oaks, maples, black walnut, hackberries, black cherry,



mesquites, and manzanitas. The common mistletoe of Kentucky is in fact sometimes called oak mistletoe because of a tendency to occur on oaks especially in the south-east U.S. Some species are conifer specialists infecting primarily junipers, but also true cedars, firs and pines. A few species will infect both hardwoods and conifers. A few are also known to infect...mistletoes (Geils et al. 2002). This double layer of parasitism is known as epiparasitism or hyperparasitism. In the Southeast and Kentucky, infections are in hardwood trees. R.L. Thompson and coworkers (Thompson 1992, Thompson and Noe 2003) of Berea College have looked at the distribution of mistletoe in host trees in Kentucky. T. E. Hemmerly and students (Rucker and Hemmerly 1976, Hemmerly et al. 1979, Hemmerly 1981, Hemmerly 1989) of Middle Tennessee State University have looked at the distribution and host specificity of mistletoe in Tennessee.

Phoradendron seldom causes economic damage to forest lands, but has been documented in nut tree and fruit orchards where the loss can be substantial. In some cases, infestations of a magnitude to cause significant mortality occur, usually in conifers. Individual trees anywhere may succumb to vigorous infestations of *Phoradendron* and treatments, although difficult, are available (Nickrent 2003, Geils et al. 2002), but the mistletoe does not seriously affect most trees.

Arceuthobium ("juniper life," from its parasitic nature on junipers and related trees), the dwarf mistletoes, consist of about 42 species distributed in both the Old and New Worlds. About 39 of these are restricted to North and Central America. The plants range in color from green to orange to reddish or even black. They have greatly reduced scale leaves, leaving the stems as the major photosynthetic organs. They produce small inconspicuous flowers and plants are dioecious. The fruit is a 1-seeded, sticky berry, which in most species is hydrostatically explosive. Spread is through this explosive action. Individual plants are seldom over 20 cm across, and often as small as a few centimeters across. Some workers have



submerged several of the species into *Phoradendron* (USDA-NRCS 2003).

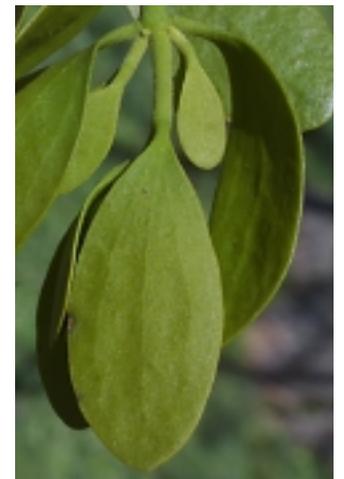
The genus is a conifer specialist infecting members of the Pinaceae (pines, firs, Douglas fir, hemlock, spruce) and Cupressaceae (junipers, true cedars). In the U.S. (Rockies and west), pines and junipers are frequently infested. The genus does not occur in the southeast U.S., but one species, *A. pusillum*, occurs in the Great Lakes states and the Northeast.

Arceuthobium frequently causes economic damage to forest lands. Most damage occurs in pine forests, but damage also occurs in Douglas fir forests. I have seen mixed white and yellow pine forest at 3000 m elevation in the Sierra Madre Occidental of Mexico covered with *Arceuthobium* plants. Studies have shown that about 60 percent of the explosively ejected seeds end up on the original host plant resulting in additional infection. About 90 percent of the remaining 40 percent lands on adjacent trees (Geils et al. 2002). The net result is rapid,

(Continued on page 10)

***Arceuthobium* is genus of mistletoe that specializes in infecting conifers. Pinyon dwarf mistletoe (*A. divaricatum*), shown above, specializes even further by infecting only pinyon pine species throughout their range in the southwestern U.S. (USDA Forest Service–Rocky Mountain Region Archives, image 1442088, accessed at www.forestryimages.org)**

The mistletoes are represented in Kentucky by oak mistletoe (*Phoradendron leucarpum*). Its growth habit, white berries, and leathery foliage are shown at left and below.



The MISTLETOES

(continued)

European mistletoe (*Viscum album*) persists in legend, lore, and medical history as successfully as in its host hardwood trees. In the U.S., it appears to have established a presence only in California.

efficient spread of the mistletoe that results in both decreased growth and death of trees. Numerous control strategies exist (see Geils et al. 2002). The extent to which this genus can become a pest is reflected in the formation of a research group to study it, The Mistletoe Center at the Rocky Mountain Research Station (see <http://www.rms.nau.edu/mistletoe/>) and publications such as that by Geils et al. (2002).

Viscum ("sticky," in reference to the coating around the seed) is an Old World genus of about 150 species occurring in both temperate and tropical regions. It infests primarily hardwood trees, especially oaks. The common European mistletoe, *V. album*, also infests apples and some evidence points to a decline in this species as apple orchards are converted to other uses (Briggs 2002). It is generally yellow green with normal, somewhat leathery

leaves. It produces small inconspicuous flowers and a 1–2 seed berry within a viscous substance. Seeds are bird dispersed in the same way that those of *Phoradendron* are. It seldom causes economic damage to forest lands.

THE LORE OF MISTLETOES

Mistletoes figure in legends, customs and medicines. Aeneas, the father of the Roman people according to Virgil, sought the 'golden bough' when he chose to visit hell. This golden bough, *Viscum album*, provided him with protection and magical powers on his journey. Whether the Druids of the British Isles were aware of this myth is not known, but they revered the plant as well.

The mistletoe of the Druids is *Viscum album*. It is not certain why this plant held the prominence in Druidism it did. Suggestions have been made, however. Tainter (2002) provides an easily read summary. To the Druids, oaks were sacred. It is surmised that a plant appearing live in winter, which also grew on some of the sacred oaks was viewed as more sacred or magical than even the oaks (although much is speculation—see Briggs 2002). Myth or legend has it that mistletoe was used in some sacrificial rituals. Conversion of the Celts to Christianity diminished the practices of the Druids, but some belief in the magical powers of mistletoe helped to propel the plant into the Christmas season custom of kissing under the mistletoe. Briggs (2002) suggests this custom arose from the mistletoe's symbol of friendship rather than of fertility. The custom was brought to the New World with English colonists who found *Phoradendron leucarpum* along the mid-Atlantic coast and in southeast colonies. New Englanders are known to have used the small, scale-leaved *Arceuthobium pusillum* (eastern dwarf mistletoe) in much the same way.

MISTLETOES IN MEDICINE

Like many plants, mistletoes have been used for medicinal purposes, and like many plants, the characteristics that make them useful as medicines also make them toxic. *Phoradendron* mistletoes are harvested as nutritional forage for livestock in some areas of Central and South America (Geils et al. 2002). Cattle poisoning has been reported (HerbMed, 1998–2003). People in these areas consume tinctures of *Phoradendron*



species as a stimulant tonic and medicines for childbirth (stopping post-partum hemorrhage) and other conditions (Geils et al.). A number of recent trials have looked at *Phoradendron* and *Viscum* extracts for treating (slowing) some cancers and HIV (HerbMed 1998–2003). In recent years, health food stores sold mistletoe 'teas.'

These mistletoes, however, contain toxic amines (tyramine and beta-phenylethylamine). Both are known to cause gastroenteritis and an occasionally fatal drastic lowering of blood pressure (Blackwell 1990, Tampion 1977). Some individuals develop dermatitis after contact with the plant. Other studies have shown that even with the ingestion of a few berries or leaves, toxicity is mild, but may include seizures (HerbMed 1998–2003). *Viscum* is believed to have similar properties (Tampion 1977). At one time, doctors in France widely prescribed mistletoe to lower blood pressure.

MISTLETOES AT HOME AND BEYOND

As you drive around Kentucky this winter, especially central Kentucky, look for the telltale balls of mistletoe in hardwood trees. Remember that is just one of many species of *Phoradendron* mistletoes and one of about 1500 species of mistletoes worldwide. Consider the human history of mistletoes presented above and search your library and the web for more.



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IT'S MEMBERSHIP RENEWAL TIME!

Renewal details and instructions are on **page 3**. Please use the enclosed envelope to return your dues with the form below right away... ↓

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Memberships are for the calendar year (January–December).

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CALENDAR of KNPS and Other Native Plant-related Events

Sat., Jan. 31 – SERVICE TRIP TO RESTORE SHORT’S GOLDENROD HABITAT, Blue Licks State Park, Robertson Co., KY. Come help with an ongoing job. Before a southern Indiana population of Short’s goldenrod was discovered in 2001, this federally endangered species was known only from a two-square mile area around Blue Licks State Park. You can help enlarge and enhance its habitat by carrying out cut cedar trees and branches to burn piles. Work clothes, sturdy boots, and gloves are essential. For details and registration, contact: Dave Skinner (502-573-2886 or david.skinner@ky.gov) or Mary Carol Cooper (859-277-0656 or marycarolcooper@insightbb.com).

Sat., Jan. 31, 9 am–5 pm – Griffith Woods Workday, Harrison Co., KY. From Lexington, go north on Russell Cave Rd. (KY 353) to US 62; turn right and enter first driveway on right. Please don’t visit at other times without permission. Details available from Julian Campbell, 859-271-4392 or jcampbell@tnc.org

Sat., Feb. 14, 9–11:30 am – Walnut Woods Restoration, Lexington, KY. Meet at UK/LFUCG Arboretum parking lot on Alumni Dr. Contact Jim Lempke, 859-257-9339 or arboretum@lsv.uky.edu

Sat., Feb. 21 – SERVICE TRIP TO RESTORE SHORT’S GOLDENROD HABITAT, Blue Licks State Park, Robertson Co., KY. See Jan. 31.

Sat., Feb. 21 – Registration Deadline for BASIC BOTANY. See p. 2.

Sat., Feb. 28 – Griffith Woods Workday. See Jan. 31 for details.

Sat., March 13, 9–11:30 am – Walnut Woods Restoration Workday, Lexington, KY. See Feb. 14 above for details.

Sat., March 27 – Griffith Woods Workday. See Jan. 31.

Fri., April 9 – Registration Deadline for BASIC PLANT ECOLOGY. Details on page 2.

Sat., April 10, 9–11:30 am – Walnut Woods Restoration Workday, Lexington, KY. See Feb. 14 above for details.

Sat., April 17 – KNPS CENTRAL KY FIELD TRIP, Grayson Co., KY. Enjoy spectacular and diverse spring wildflowers on rarely accessible private land. Meet at 9:30 am (Central) at the grocery store/Chevron station in Short Creek, KY—12 miles west of Leitchfield at the intersection of highways 54 and 79. If you come from the west on Western KY Parkway, exit at Caneyville and take Hwy. 79 north to above location. Bring lunch, get a sandwich and drink at the Short Creek store, or dine at nearby Rough River State Park. Notify the trip leader, long-time KNPS member Joyce Porter, by phone or mail if you’re coming: (270) 879-9765; 10995 Owensboro Rd., Falls of Rough, KY 40119.

Sat., April 24 – Open House/Book Signing at the Garden for the Birds, Lexington, KY. KNPS board member Tom Barnes, author and photographer of *Gardening for the Birds* and *Kentucky’s Last Great Places*, has invited KNPS members to an open house (yard actually) at his home, 1733 Albemarle Rd., in Lexington. Visitors can tour the gardens and get a discount on Dr. Barnes’ latest, the new *Wildflowers and Ferns of Kentucky* (co-authored by former KNPS president Wilson Francis).

Fri.–Sun., April 30–May 1 – NATURAL BRIDGE WILDFLOWER WEEKEND AND KNPS SPRING MEETING, Natural Bridge State Resort Park, Slade, KY. More info to come. SEE YOU THERE!

SEE PAGE 2 FOR CONTACT INFORMATION.

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