

9-2009

Flowering Plants: Smartweeds to Hazelnuts

Robert H. Mohlenbrock
Southern Illinois University Carbondale

Follow this and additional works at: http://opensiuc.lib.siu.edu/siupress_flora_of_illinois



Part of the [Botany Commons](#)

Recommended Citation

Mohlenbrock, Robert H., "Flowering Plants: Smartweeds to Hazelnuts" (2009). *Illustrated Flora of Illinois*. 13.
http://opensiuc.lib.siu.edu/siupress_flora_of_illinois/13

This Book is brought to you for free and open access by the Southern Illinois University Press at OpenSIUC. It has been accepted for inclusion in Illustrated Flora of Illinois by an authorized administrator of OpenSIUC. For more information, please contact opensiuc@lib.siu.edu.

The Illustrated Flora of Illinois

FLOWERING

PLANTS

Smartweeds to Hazelnuts

Second Edition

**Robert H. Mohlenbrock
and Paul M. Thomson Jr.**



THE ILLUSTRATED FLORA OF ILLINOIS

The Illustrated Flora of Illinois

ROBERT H. MOHLENBROCK, General Editor

THE ILLUSTRATED FLORA OF ILLINOIS

FLOWERING PLANTS
smartweeds to hazelnuts

SECOND EDITION

Robert H. Mohlenbrock
and
Paul M. Thomson Jr.



SOUTHERN ILLINOIS UNIVERSITY PRESS
Carbondale

Copyright © 2009 by the Board of Trustees,
Southern Illinois University
All rights reserved
Printed in the United States of America
12 11 10 09 4 3 2 1

Library of Congress Cataloging-in-Publication Data

Mohlenbrock, Robert H., 1931–

Flowering plants : smartweeds to hazelnuts / Robert H. Mohlenbrock and
Paul M. Thomson Jr. — 2nd ed.

p. cm. — (Illustrated flora of Illinois)

Includes bibliographical references and index.

ISBN-13: 978-0-8093-2926-7 (alk. paper)

ISBN-10: 0-8093-2926-3 (alk. paper)

1. Botany—Illinois. 2. Plants—Illinois—Identification. 3. Plants—
Illinois—Pictorial works. 4. Dicotyledons—Illinois—Identification.
5. Phytogeography—Illinois. I. Thomson, Paul M., 1942– II. Title. III. Series.

QK157.M6225 2009

581.9773—DC22

2009019334

Printed on recycled paper. ♻️

The paper used in this publication meets the minimum requirements of
American National Standard for Information Sciences—Permanence of
Paper for Printed Library Materials, ANSI Z39.48-1992. ∞

This book is dedicated to
Wendy Ann Preece,
who has prepared the maps for most
of the volumes
in this series.

CONTENTS

List of Illustrations	ix
Preface to Second Edition	xiii
Preface	xv
Introduction	I
Descriptions and Illustrations	5
Polygonaceae— <i>Smartweed Family</i>	5
Hamamelidaceae— <i>Witch Hazel Family</i>	106
Platanaceae— <i>Sycamore Family</i>	109
Fagaceae— <i>Beech Family</i>	114
Betulaceae— <i>Birch Family</i>	180
Corylaceae— <i>Hazelnut Family</i>	201
Species Excluded	211
Appendix: Additions and Changes to the First Edition	215
Summary of the Taxa Treated in This Volume	265
Glossary	267
Literature Cited	273
Index of Plant Names	275

ILLUSTRATIONS

1. <i>Brunnichia ovata</i> (Ladies' Eardrops).	7
2. <i>Polygonella articulata</i> (Jointweed).	9
3. <i>Rheum rhaponticum</i> (Rhubarb).	11
4. <i>Rheum rhaponticum</i> (Rhubarb).	12
5. <i>Rumex acetosella</i> (Sour Dock; Sheep Sorrel).	16
6. <i>Rumex hastatulus</i> (Sour Dock).	18
7. <i>Rumex longifolius</i> (Dock).	20
8. <i>Rumex maritimus</i> var. <i>fueginus</i> (Golden Dock).	21
9. <i>Rumex obtusifolius</i> (Bitter Dock).	23
10. <i>Rumex obtusifolius</i> (Bitter Dock).	24
11. <i>Rumex patientia</i> (Patience Dock).	26
12. <i>Rumex crispus</i> (Curly Dock).	28
13. <i>Rumex crispus</i> (Curly Dock).	29
14. <i>Rumex altissimus</i> (Pale Dock).	30
15. <i>Rumex orbiculatus</i> (Water Dock).	32
16. <i>Rumex verticillatus</i> (Swamp Dock).	34
17. <i>Rumex mexicanus</i> (Dock).	36
18. <i>Rumex cristatus</i> (Crested Dock).	38
19. <i>Fagopyrum esculentum</i> (Buckwheat).	40
20. <i>Polygonum sagittatum</i> (Tear Thumb).	45
21. <i>Polygonum arifolium</i> (Tear Thumb).	47
22. <i>Polygonum convolvulus</i> (Black Bindweed).	49
23. <i>Polygonum cristatum</i> (Crested False Buckwheat).	51
24. <i>Polygonum scandens</i> (False Buckwheat).	53
25. <i>Polygonum tenue</i> (Slender Knotweed).	55
26. <i>Polygonum aviculare</i> (Knotweed).	56
27. <i>Polygonum buxiforme</i> (Knotweed).	58
28. <i>Polygonum prolificum</i> (Knotweed).	59
29. <i>Polygonum exsertum</i> (Long-fruited Knotweed).	61
30. <i>Polygonum ramosissimum</i> (Knotweed).	63
31. <i>Polygonum erectum</i> (Knotweed).	65
32. <i>Polygonum achoreum</i> (Knotweed).	66
33. <i>Polygonum arenastrum</i> (Knotweed).	68
34. <i>Polygonum neglectum</i> (Knotweed).	70
35. <i>Polygonum sachalinense</i> (Giant Knotweed).	71

36. <i>Polygonum cuspidatum</i> (Japanese Knotweed).	73
37. <i>Polygonum virginianum</i> (Virginia Knotweed).	75
38. <i>Polygonum careyi</i> (Carey's Smartweed).	76
39. <i>Polygonum orientale</i> (Prince's Feather).	78
40. <i>Polygonum punctatum</i> (Smartweed).	80
41. <i>Polygonum hydropiper</i> (Water Pepper; Smartweed).	82
42. <i>Polygonum persicaria</i> (Lady's Thumb).	84
43. <i>Polygonum cespitosum</i> var. <i>longisetum</i> (Creeping Smartweed).	85
44. <i>Polygonum setaceum</i> var. <i>interjectum</i> (Smartweed).	87
45. <i>Polygonum hydropiperoides</i> (Mild Water Pepper; Smartweed).	89
46. <i>Polygonum opelousanum</i> (Water Pepper).	91
47. <i>Polygonum amphibium</i> (Water Smartweed; Scarlet Smartweed).	94
48. <i>Polygonum amphibium</i> (Water Smartweed; Scarlet Smartweed).	95
49. <i>Polygonum amphibium</i> (Water Smartweed; Scarlet Smartweed).	96
50. <i>Polygonum bicornis</i> (Smartweed).	98
51. <i>Polygonum scabrum</i> (Smartweed).	100
52. <i>Polygonum lapathifolium</i> (Pale Smartweed).	101
53. <i>Polygonum pennsylvanicum</i> (Common Smartweed; Smartweed).	104
54. <i>Hamamelis virginiana</i> (Witch Hazel).	107
55. <i>Liquidambar styraciflua</i> (Sweet Gum; Red Gum.)	110
56. <i>Liquidambar styraciflua</i> (Sweet Gum; Red Gum.)	111
57. <i>Platanus occidentalis</i> (Sycamore; Plane Tree).	112
58. <i>Fagus grandifolia</i> var. <i>caroliniana</i> (Beech).	116
59. <i>Castanea dentata</i> (American Chestnut).	119
60. <i>Castanea mollissima</i> (Chinese Chestnut).	121
61. Diagrams of acorns.	123
62. Diagrams of acorns (continued).	124
63. Leaf trichome types.	125
64. <i>Quercus phellos</i> (Willow Oak).	130
65. <i>Quercus imbricaria</i> (Shingle Oak).	132
66. <i>Quercus imbricaria</i> (Shingle Oak).	133
67. <i>Quercus shumardii</i> (Shumard's Oak).	135
68. <i>Quercus shumardii</i> (Shumard's Oak).	136
69. <i>Quercus rubra</i> (Northern Red Oak).	138
70. <i>Quercus rubra</i> (Northern Red Oak).	139

71. <i>Quercus velutina</i> (Black Oak).	141
72. <i>Quercus velutina</i> (Black Oak).	142
73. <i>Quercus ellipsoidalis</i> (Hill's Oak).	144
74. <i>Quercus coccinea</i> (Scarlet Oak).	146
75. <i>Quercus palustris</i> (Pin Oak).	149
76. <i>Quercus palustris</i> (Pin Oak).	150
77. <i>Quercus nuttallii</i> (Nuttall's Oak).	151
78. <i>Quercus marilandica</i> (Blackjack Oak).	153
79. <i>Quercus falcata</i> (Spanish Oak).	155
80. <i>Quercus pagoda</i> (Cherrybark Oak).	157
81. <i>Quercus alba</i> (White Oak).	159
82. <i>Quercus alba</i> (White Oak).	160
83. <i>Quercus prinoides</i> var. <i>acuminata</i> (Chinquapin Oak; Yellow Chestnut Oak).	163
84. <i>Quercus prinoides</i> var. <i>acuminata</i> (Chinquapin Oak; Yellow Chestnut Oak).	164
85. <i>Quercus montana</i> (Rock Chestnut Oak).	167
86. <i>Quercus michauxii</i> (Swamp Chestnut Oak; Basket Oak; Cow Oak).	169
87. <i>Quercus bicolor</i> (Swamp White Oak).	171
88. <i>Quercus macrocarpa</i> (Bur Oak; Mossy-cup Oak).	173
89. <i>Quercus macrocarpa</i> (Bur Oak; Mossy-cup Oak).	174
90. <i>Quercus stellata</i> (Post Oak).	176
91. <i>Quercus stellata</i> (Post Oak).	177
92. <i>Quercus lyrata</i> (Overcup Oak).	179
93. <i>Betula alleghaniensis</i> (Yellow Birch).	182
94. <i>Betula nigra</i> (River Birch; Red Birch).	184
95. <i>Betula papyrifera</i> (Paper Birch; Canoe Birch).	186
96. <i>Betula populifolia</i> (Gray Birch).	188
97. <i>Betula X sandbergii</i> (Sandberg's Birch).	190
98. <i>Betula X purpusii</i> (Purpus' Birch).	192
99. <i>Betula pumila</i> (Dwarf Birch).	195
100. <i>Alnus glutinosa</i> (Black Alder; European Alder).	197
101. <i>Alnus rugosa</i> (Speckled Alder).	199
102. <i>Alnus serrulata</i> (Hazel Alder; Common Alder; Smooth Alder).	200
103. <i>Ostrya virginiana</i> (Hop Hornbeam; Ironwood).	203
104. <i>Corylus americana</i> (Hazelnut; American Filbert).	205
105. <i>Corylus rostrata</i> (Beaked Hazelnut).	207
106. <i>Carpinus caroliniana</i> (Blue Beech; American Hornbeam; Ironwood; Muscle Wood).	209

<i>A1. Rumex conglomeratus</i> (Clustered Green Dock).	219
<i>A2. Rumex dentatus</i> (Toothed Dock).	221
<i>A3. Rumex stenophyllus</i> (Narrow-leaved Curly Dock).	223
<i>A4. Fallopia cilioidis</i> (Bristly Climbing Buckwheat).	227
<i>A5. Fallopia dumetorum</i> (Climbing Buckwheat).	229
<i>A6. Polygonum patulum</i> (Tuberclad Knotweed).	233
<i>A7. Polygonum rurivagum</i> (Narrow-leaved Knotweed).	235
<i>A8. Reynoutria X bohemica</i> (Bohemian Knotweed).	237
<i>A9. Persicaria bungeana</i> (Prickly Smartweed).	245
<i>A10. Persicaria glabra</i> (Smooth Smartweed).	247
<i>A11. Persicaria robustior</i> (Stout Smartweed).	249
<i>A12. Quercus acutissima</i> (Sawtooth Oak).	256
<i>A13. Betula pendula</i> (European Weeping Birch).	260
<i>A14. Alnus rugosa</i> (Speckled Alder).	262

PREFACE TO THE SECOND EDITION

Since the publication of the first edition of *Smartweeds to Hazelnuts* in 1987, twelve additional species and one hybrid of plants covered by this book have been discovered in Illinois. In addition, numerous nomenclatural changes have occurred for plants already known from the state, and a great number of county records have been added. Several new keys have also been written. This second edition of *Smartweeds to Hazelnuts* is intended to update the status for the plant families covered in this book.

Original illustrations for all the new species and the hybrid have been prepared by Paul W. Nelson.

P R E F A C E

Several volumes in The Illustrated Flora of Illinois series will be devoted to dicotyledonous flowering plants; this volume is the fifth one. It follows publication of one on ferns, five on monocotyledonous plants, and four previous volumes on dicots.

The concept of The Illustrated Flora of Illinois is to produce a multivolumed flora of the plants of the state of Illinois which will include algae, fungi, mosses, liverworts, lichens, ferns, and seed plants. For each kind of plant known to occur in Illinois, a complete description, illustrations showing diagnostic features, distribution maps, and ecological notes will be provided. Keys to aid in identification of the plants will be presented.

An advisory board was created in 1964 to criticize, evaluate, and make suggestions for each volume of The Illustrated Flora during its preparation. The board consists of botanists eminent in their area of specialty—Dr. Constantine J. Alexopoulos, University of Texas (fungi); Dr. Gerald W. Prescott, University of Montana (algae); Dr. Aaron J. Sharp, University of Tennessee (mosses, liverworts, lichens); Dr. Robert F. Thorne, Rancho Santa Ana Botanical Garden (flowering plants); and Dr. Rolla M. Tryon, Jr., The Gray Herbarium of Harvard University (ferns).

To date, I have been the author of each volume that has been prepared. In this volume, I have been joined by my former student, Dr. Paul M. Thomson, Jr., Director, Blue Springs Campus, Metropolitan Community Colleges, Kansas City, Missouri, who has contributed the Fagaceae as well as *Platanus*, *Ostrya*, *Carpinus*, and *Corylus*. In subsequent volumes that are not written by me, I will serve as editor.

There is no definite sequence for publication of The Illustrated Flora of Illinois. Volumes will appear as they are completed.

The Illustrated Flora of Illinois

FLOWERING PLANTS
smartweeds to hazelnuts



WISCONSIN

IOWA

INDIANA

MISSOURI

KENTUCKY

County Map of Illinois

Introduction

Flowering plants that form two “seed leaves,” or cotyledons, when the seed germinates are called dicotyledons, or dicots. These far exceed the number of species of monocots, or flowering plants that produce a single “seed leaf” upon germination. This is the fifth volume of *The Illustrated Flora of Illinois* to be devoted to the dicots of Illinois.

The system of classification adopted for *The Illustrated Flora of Illinois* was proposed by Thorne in 1968. This system is a marked departure from the more familiar system of Engler and Prantl. This latter system, which is still followed in most regional floras, is out-of-date and does not reflect the vast information recently gained from the study of cytology, biochemistry, anatomy, and embryology.

Since the arrangement of orders and families proposed by Thorne is unfamiliar to many, an outline of the orders and families of flowering plants known to occur in Illinois is presented. Those names in boldface are described in this volume of *The Illustrated Flora of Illinois*.

Order Annonales	Family Ericaceae
Family Magnoliaceae	Order Ebenales
Family Annonaceae	Family Ebenaceae
Family Calycanthaceae	Family Styracaceae
Family Aristolochiaceae	Family Sapotaceae
Family Lauraceae	Order Primulales
Family Saururaceae	Family Primulaceae
Order Berberidales	Order Cistales
Family Menispermaceae	Family Violaceae
Family Ranunculaceae	Family Cistaceae
Family Berberidaceae	Family Passifloraceae
Family Papaveraceae	Family Cucurbitaceae
Order Nymphaeales	Family Loasaceae
Family Nymphaeaceae	Order Salicales
Family Ceratophyllaceae	Family Salicaceae
Order Sarraceniales	Order Tamaricales
Family Sarraceniaceae	Family Tamaricaceae
Order Theales	Order Capparidales
Family Aquifoliaceae	Family Capparidaceae
Family Hypericaceae ¹	Family Resedaceae
Family Elatinaceae	Family Brassicaceae

Order Malvales
Family Sterculiaceae
Family Tiliaceae
Family Malvaceae
Order Urticales
Family Ulmaceae
Family Moraceae
Family Urticaceae
Order Rhamnales
Family Rhamnaceae
Family Elaeagnaceae
Order Euphorbiales
Family Thymelaeaceae
Family Euphorbiaceae
Order Solanales
Family Solanaceae
Family Convolvulaceae
Family Polemoniaceae
Order Campanulales
Family Campanulaceae
Order Santalales
Family Celastraceae
Family Santalaceae
Family Loranthaceae
Order Oleales
Family Oleaceae
Order Geraniales
Family Linaceae
Family Zygophyllaceae
Family Oxalidaceae
Family Geraniaceae
Family Balsaminaceae
Family Limnanthaceae
Family Polygalaceae
Order Rutales
Family Rutaceae
Family Simaroubaceae
Family Anacardiaceae
Family Sapindaceae
Family Aceraceae
Family Hippocastanaceae
Family Juglandaceae
Order Myricales
Family Myricaceae
Order Chenopodiales

Family Phytolaccaceae
Family Nyctaginaceae
Family Aizoaceae
Family Cactaceae
Family Portulacaceae
Family Chenopodiaceae
Family Amaranthaceae
Family Caryophyllaceae
Family Polygonaceae
Order Hamamelidales
Family Hamamelidaceae
Family Platanaceae
Order Fagales
Family Fagaceae
Family Betulaceae
Family Corylaceae
Order Rosales
Family Rosaceae
Family Fabaceae
Family Crassulaceae
Family Saxifragaceae
Family Droseraceae
Family Staphyleaceae
Order Myrtales
Family Lythraceae
Family Melastomaceae
Family Onagraceae
Order Gentianales
Family Loganiaceae
Family Rubiaceae
Family Apocynaceae
Family Asclepiadaceae²
Family Gentianaceae
Family Menyanthaceae
Order Bignoniales
Family Bignoniaceae
Family Martyniaceae
Family Scrophulariaceae
Family Plantaginaceae
Family Orobanchaceae
Family Lentibulariaceae
Family Acanthaceae
Order Cornales
Family Vitaceae
Family Nyssaceae

Family Cornaceae
 Family Haloragidaceae
 Family Hippuridaceae
 Family Araliaceae
 Family Apiaceae³
 Order Dipsacales
 Family Caprifoliaceae
 Family Adoxaceae
 Family Valerianaceae
 Family Dipsacaceae

Order Lamiales
 Family Hydrophyllaceae
 Family Boraginaceae
 Family Verbenaceae
 Family Phrymataceae⁴
 Family Callitrichaceae
 Family Lamiaceae
 Order Asterales
 Family Asteraceae

¹ Called Clusiaceae by Thorne (1968).

² Included in Apocynaceae by Thorne (1968).

³ Included in Araliaceae by Thorne (1968).

⁴ Included in Verbenaceae by Thorne (1968).

Included in this volume is one family, the Polygonaceae, from the large order Chenopodiales, and two orders in their entirety, the Hamamelidales, with two families, and the Fagales, with three families. Eight other families of the order Chenopodiales will be in other volumes of *The Illustrated Flora of Illinois*.

Since only a small number of dicot families are treated in this book, no general key to the dicot families has been provided. The reader is invited to use my companion book, *Guide to the Vascular Flora of Illinois. Revised and Enlarged Edition* (1986), for keys to all families of flowering plants in Illinois.

The Polygonaceae is the only family in this book in which at least the staminate flowers are not borne in asexual apetalous spikes known as catkins. They are an advanced member of the order Chenopodiales, according to Thorne (1968). Cronquist (1981), on the other hand, considers the Polygonaceae to be the sole family in the order Polygonales. In the Cronquist system, however, both the Polygonaceae and the other Illinois families of Chenopodiales, according to Thorne, are placed in the subclass Caryophyllidae.

The Hamamelidales, containing the Hamamelidaceae and the Platanaceae, and the Fagales, containing the Fagaceae, the Betulaceae, and the Corylaceae are included by Cronquist (1981) in the subclass Hamamelidae.

From a phylogenetic point of view, all the families treated in this volume are considered to be advanced families, that is, they have characteristics which generally are not considered to be primitive. Because the floral parts in these families are often highly reduced, it is often difficult to determine the exact relationship of these families.

Except for the Polygonaceae, the families described and illustrated in this volume are woody. Most of these woody plants, with the exception of the witch hazel (*Hamamelis virginiana*), have flowers without petals.

The nomenclature for the species and lesser taxa used in this volume has been arrived at after lengthy study of recent floras and monographs. Synonyms, with complete author citation, that have applied to species in Illinois are given under each species. A description, while not necessarily intended to be complete, covers the more important features of the species.

The common name, or names, is the one used locally in Illinois. The habitat designation is not always the habitat throughout the range of the species, but only for it in Illinois. The overall range for each species is given from the northeastern to the northwestern extremities, south to the southwestern limit, then eastward to the southeastern limit. The range has been compiled from various sources, including examination of herbarium material and some field studies. A general statement is given concerning the range of each species in Illinois. Dot maps showing county distribution for each taxon are provided. Each dot represents a voucher specimen deposited in some herbarium. There has been no attempt to locate each dot with reference to the actual locality within each county.

The distribution has been compiled from extensive field study as well as herbarium study. Herbaria from which specimens have been studied are located at Eastern Illinois University, the Field Museum of Natural History, the Gray Herbarium of Harvard University, the Illinois Natural History Survey, the Illinois State Museum, Knox College, the Missouri Botanical Garden, the Morton Arboretum, the New York Botanical Garden, Southern Illinois University at Carbondale, the United States National Herbarium, University of Illinois, and Western Illinois University. In addition, some private collections have been examined. The author is indebted to the curators and staffs of these herbaria for the courtesies extended.

I am deeply grateful to Gaylord and Dorothy Donnelley for their generous support that made this volume possible.

The illustrations for each species, depicting the habit and the distinguishing features, were prepared by Mr. Paul Nelson. My daughter Wendy prepared the maps, while my wife Beverly assisted me in several of the herbaria and typed all the drafts of the manuscript. Without the help of all those individuals and organizations mentioned above, this book would not have been possible.

Descriptions and Illustrations

Order Chenopodiales

The Chenopodiales are represented in Illinois by nine families—Phytolaccaceae, Nyctaginaceae, Aizoaceae, Cactaceae, Portulacaceae, Chenopodiaceae, Amaranthaceae, Caryophyllaceae, and Polygonaceae. Only the Polygonaceae are treated in this book; the others will be in subsequent volumes in the series. Of these nine families of Chenopodiales in Illinois, the Polygonaceae are considered to be the most advanced by Thorne (1968).

POLYGONACEAE—SMARTWEED FAMILY

Herbs, less commonly shrubs, rarely trees, often with swollen nodes; leaves simple, alternate, entire, stipulate, the stipules usually sheathing; inflorescence various; flowers usually small, perfect, rarely unisexual, actinomorphic or zygomorphic; sepals 3–6, free or united, often persistent; petals absent; stamens 4–12, free; styles 2–3, free or united at the base; ovary superior, 2- to 4-carpellate, with 1 erect ovule; fruit an achene, often angled or winged.

The Polygonaceae is a family of about 30 genera and nearly 1,000 species, distributed in both temperate and tropical regions of the world.

Stipules, when present, usually form a cylindrical sheath around the stem. These specialized stems are known as ocreae (sing., ocrea). Smaller cylindrical sheaths associated with the flowers are called ocreolae (sing., ocreola).

Six genera and 44 species are recognized in Illinois.

KEY TO THE GENERA OF Polygonaceae IN ILLINOIS

1. Climbing shrubs with tendrils; pedicels winged on one side by the calyx _____ 1. *Brunnichia*
1. Prostrate or ascending or erect herbs or, if climbing, then without tendrils; pedicels not winged by the calyx _____ 2
 2. Leaves very narrow, needlelike _____ 2. *Polygonella*
 2. Leaves linear or broader, not needlelike _____ 3
3. Sepals 6; stamens 6 (–10) _____ 4
3. Sepals usually 5; stamens 3–8 _____ 5

- 4. All sepals similar; fruit 3-winged ----- 3. *Rheum*
- 4. Outer sepals narrower than inner sepals; fruit 3-angled _ 4. *Rumex*
- 5. Stems retrorse prickly ----- 6. *Polygonum*
- 5. Stems not retrorse prickly ----- 6
- 6. Leaves hastate-deltoid ----- 5. *Fagopyrum*
- 6. Leaves not hastate-deltoid ----- 6. *Polygonum*

1. *Brunnichia* Banks–Buckwheat Vine

Woody vines climbing by tendrils; leaves alternate, entire, petio- late; ocreae absent, with only a pubescent ring at each node; inflo- rescence a series of slender racemes; flowers perfect, zygomorphic, with the pedicel winged on one side; calyx 5-parted, petaloid, winged on one side; petals absent; stamens 8; styles 3; ovary supe- rior, with a solitary ovule; achene enclosed by the persistent calyx and the winged pedicel.

Our species and three from tropical Africa comprise this genus. Only the following species occurs in Illinois.

- 1. *Brunnichia ovata* (Walt.) Shinnery, Sida 3:115. 1967. Fig. 1. *Rajania ovata* Walt. Fl. Carol. 247. 1788.
- Brunnichia cirrhosa* Banks ex Gaertn. Fruct. & Sem. 1:213, pl. 45. 1788.

High-climbing woody vine; stems grooved, glabrous, much branched, up to 2 cm in diameter, with pubescent rings at each node representing the stipules; leaves ovate, abruptly acuminate at the apex, subcordate to truncate at the base, puberulent on the lower surface, up to 15 cm long, up to 7 cm broad; inflorescence a series of racemes, the lowest in the axils of leaves, the uppermost in a panicle; flowers perfect, the pedicels jointed, winged on one side, to 10 mm long; calyx to 4 mm long, greenish, tubular below, 5-lobed above, the lobes oblong, obtuse, winged on one side; petals absent; stamens 8, slightly exerted; styles 3, with bilobed stigmas; fruits up to 3.5 cm long, up to 8 mm broad, brown, the enlarged, coriaceous calyx persistent; achene oblongoid, to 1 cm long, 3- angled.



1. *Brunnichia ovata* (Ladies' Eardrops). a. Flowering branch, $\times \frac{1}{2}$. b. Flower, $\times 12$. c. Sepal, $\times 25$. d. Pistil, $\times 30$. e. Fruit, $\times 5$.



COMMON NAME: Ladies' Eardrops.

HABITAT: Swampy woods.

RANGE: South Carolina to Oklahoma, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Confined to the southern one-sixth of the state. There is a collection from a fence in Richland County that is probably an escape.

This species, sometimes also known as buckwheat vine, is a characteristic species of the southeastern United States.

It is confined to swampy woods in the extreme southern tip of the state.

The flower and fruit are bizarre structures in which a wing extends down one side of the calyx and along one side of the pedicel. This wing persists during fruit.

Ladies' eardrops blooms from June to August.

2. *Polygonella* Michx.-Jointweed

Annual or perennial herbs, sometimes becoming woody below; leaves alternate, entire, very narrow, jointed with the top of the ocreae; inflorescence a series of racemes; flowers perfect, usually zygomorphic; calyx 5-parted, the lobes usually dimorphic, petaloid; petals absent; stamens 8; styles 3, free; ovary superior, with 1 ovule; achene 3-angled, loosely enclosed by the persistent calyx.

This is a genus of about ten species of the eastern and southeastern United States.

Only the following species occurs in Illinois.

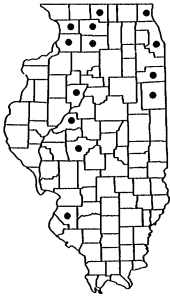
1. *Polygonella articulata* (L.) Meisn. Ger. 2:228. 1836-43. Fig. 2.

Polygonum articulatum L. Sp. Pl. 363. 1753.

Annual from slender roots; stem erect to spreading, slender, glabrous, glaucous, branched or unbranched, up to 30 cm tall; leaves linear to filiform, revolute, glabrous, glaucous, obtuse to acute at the apex, tapering to the sessile base, to 20 mm long, about 1 mm broad, jointed to the ocreae; inflorescence a series of slender racemes, erect, several-flowered, with crowded ocreolae giving the inflorescence a jointed appearance; calyx 5-parted, white, to 2 mm long, the lobes dimorphic, the outer two obovate, keeled, the inner three elliptic; stamens 8; achene 3-angled, loosely enclosed by the enlarged, persistent sepals.



2. *Polygonella articulata* (Jointweed). a. Habit, $\times 2$. b. Flower and ocreolae, $\times 30$.
 c. Ocrea, $\times 15$. d. Sepals, $\times 40$. e. Achene, $\times 35$.



COMMON NAME: Jointweed.

HABITAT: Areas of bare sand.

RANGE: Maine to North Carolina, along the coast; inland sand dune areas in states around Lake Michigan and into Iowa.

ILLINOIS DISTRIBUTION: Confined to the northern half of Illinois; also St. Clair County.

In sandy blowout areas, which is a typical habitat for this species, Swink (1974) lists *Hudsonia tomentosa* and *Panicum villosissimum* var. *pseudopubescens* as consistent associates.

The earliest reports of this species from Illinois were listed as *Polygonum articulatum*.

This species flowers from July to early November.

3. *Rheum* L. -Rhubarb

Perennial herbs; leaves cauline and basal, palmately veined; flowering stems hollow, with a terminal panicle; flowers small, perfect, actinomorphic; sepals 6-8; petals absent; stamens 6-10; styles 3; ovary superior, with 1 ovule; fruit a winged achene, subtended by the sepals.

About 30 species from Asia comprise this genus.

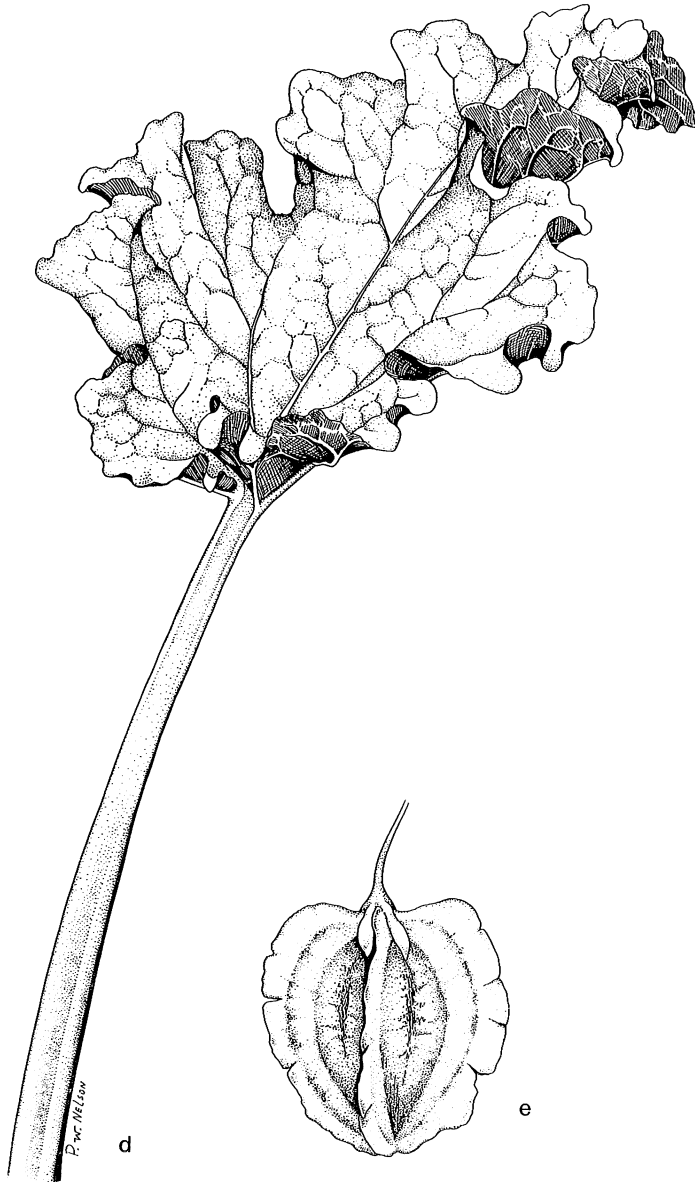
Only the following species occurs in Illinois.

1. *Rheum rhaponticum* L. Sp. Pl. 372. 1753. Figs. 3, 4.

Perennial herb from large, fleshy roots; basal leaves broadly ovate, obtuse to subacute at the apex, cordate to rounded at the base, glabrous, entire but wavy-edged, sheathing at the base, to 70 cm long, borne on long, stout pedicels; leaves on flowering stem smaller; flowering stem hollow, glabrous, usually branched, to 2 m tall; inflorescence panicate; flowers small, on jointed pedicels; sepals 6-8, green to pink; petals absent; stamens 6-10; achenes dark brown to black, to 1 cm long, subtended by the sepals, giving the fruit a winged appearance.



3. *Rheum rhaponticum* (Rhubarb). a. Leaves and flowers, $\times \frac{1}{4}$. b. Flower, $\times 15$. c. Sepal, $\times 25$.



4. *Rheum raphaniticum* (Rhubarb). d. Leaf, $\times \frac{1}{2}$. e. Fruit, $\times 5$.



COMMON NAME: Rhubarb.

HABITAT: Disturbed soil.

RANGE: Native of Asia; commonly planted in gardens.

ILLINOIS DISTRIBUTION: Specimens have been seen from Champaign and Cook counties, where they supposedly persisted after cultivation.

This is the plant known as rhubarb. The reddish petioles may be gathered in the spring and cooked, but older parts have poisonous properties.

Rhubarb flowers from July to September.

4. *Rumex* L. —Dock; Sorrel

Annual or perennial herbs, becoming woody in the tropics; leaves alternate, entire or undulate, with sheathing stipules; inflorescence with verticillate flowers in paniculate racemes; flowers small, perfect, less commonly unisexual, on jointed pedicels; sepals 6, green to reddish, the outer 3 smaller, the inner 3 becoming enlarged in fruit; petals absent; stamens 6; styles 3; ovary superior, with 1 ovule; fruit an achene with the 3 inner sepals enlarged and attached, 1, 2, or all 3 of the sepals with a tubercle.

About 150 species native to both Old and New World temperate regions make up this genus.

As the fruit develops, the three innermost sepals enlarge, becoming veiny, and form wings on the achene. At this stage, the sepals are referred to as valves. Sometimes, along the midvein of 1 or more of these valves, a tubercle, known as a grain, may be formed. The valves may also develop small spinelike projections along their margins.

The Illinois species of *Rumex* fall naturally into three subgenera. Subgenus *Acetosella*, composed of *R. acetosella*, is dioecious with the horizontal rootstocks, an acid taste to the leaves, and the inner sepals not enlarged in fruit. Subgenus *Acetosa*, with only *R. hastatulus* in Illinois, is dioecious with a vertical root, an acid taste to the leaves, and the inner sepals enlarged in fruit. Subgenus *Rumex*, which contains the remainder of the Illinois species, is monoecious, lacks the acid taste of the leaves, and has the inner sepals enlarged in fruit.

KEY TO THE SPECIES OF *Rumex* IN ILLINOIS

1. Some of the leaves hastate (rarely entire in one form of *R. acetosella*); plants dioecious ----- 2

1. Leaves not hastate; plants monoecious ----- 3
2. Plants with stolons or slender rhizomes; achenes exerted from calyx ----- 1. *R. acetosella*
2. Plants with a taproot; achenes enclosed by the calyx -----
----- 2. *R. hastatulus*
3. All fruiting valves lacking tubercles ----- 3. *R. longifolius*
3. At least one of the fruiting valves with a well-developed tubercle ___ 4
4. Fruiting sepals with spinulose bristles ----- 5
4. Fruiting sepals entire or only minutely toothed ----- 6
5. Stems hollow; tubercle of fruit long and slender; bristles longer than width of fruiting sepals ----- 4. *R. maritimus*
5. Stems firm; tubercle of fruit only slightly longer than broad; bristles not longer than width of fruiting sepals ----- 5. *R. obtusifolius*
6. Only one of the 3 fruiting sepals with a tubercle ----- 7
6. Each of the fruiting sepals with a tubercle ----- 9
7. Some of the leaves over 10 cm broad; each fruiting sepal 8–10 mm broad ----- 6. *R. patientia*
7. None of the leaves 10 cm broad; each fruiting sepal up to 6 mm broad -----
----- 8
8. Leaves wavy along the margins ----- 7. *R. crispus*
8. Leaves flat ----- 8. *R. altissimus*
9. Leaves with conspicuous wavy margins ----- 7. *R. crispus*
9. Leaves flat, entire or crenulate ----- 10
10. Leaves crenulate; lateral veins of leaves forming right angles with vertical veins ----- 9. *R. orbiculatus*
10. Leaves entire; lateral veins of leaves ascending ----- 11
11. Fruiting pedicels two to five times as long as the calyx -----
----- 10. *R. verticillatus*
11. Fruiting pedicels shorter than to about twice as long as the calyx _ 12
12. Pedicels 1½–2 times longer than the calyx; achene 3.0–3.2 mm long ----- 12. *R. cristatus*
12. Pedicels shorter than or equaling the calyx; achene 1.5–2.8 mm long ----- 13
13. Leaves narrowly lanceolate, never more than 3 cm broad -----
----- 11. *R. mexicanus*
13. Leaves broadly lanceolate, at least some of them over 3 cm broad ___
----- 8. *R. altissimus*

1. *Rumex acetosella* L. Sp. Pl. 333. 1753.

Annual or perennial dioecious herbs with slender, horizontal rootstocks; stems erect, slender, glabrous, branched or unbranched, to

40 cm tall; leaves narrowly hastate, rarely unlobed, to 10 cm long, glabrous, the terminal lobe lanceolate to narrowly elliptic, acute, the lateral lobes divergent, acute, with an acidic taste, on petioles often as long as or longer than the blades, the ocreae shredded, silvery; inflorescence a series of erect, interrupted racemes; flowers unisexual, nodding, on jointed pedicels up to 2 mm long; outer sepals lanceolate, to 1.5 mm long; inner sepals to 2 mm long, obovate in the staminate flower, broadly ovate in the pistillate flower; stamens 6, exserted; achene to 1.5 mm long, shining golden brown, 3-angular, the persistent calyx not enlarged.

Two forms are known from Illinois, distinguished by the following key.

1. Most or all the leaves hastate ----- 1a. *R. acetosella* f. *acetosella*
 1. None of the leaves hastate ----- 1b. *R. acetosella* f. *integrifolius*

1a. *Rumex acetosella* L. f. *acetosella* Fig. 5a-9.

Most or all the leaves hastate.



COMMON NAMES: Sour Dock; Sheep Sorrel.

HABITAT: Fields, roadsides, waste areas, usually where the soil is acidic.

RANGE: Native of Europe and Asia; adventive throughout most of the United States and Canada.

ILLINOIS DISTRIBUTION: Known from every county.

This is a common plant of abandoned fields and other disturbed areas. Its inflorescence is yellowish or reddish. The plant is a troublesome weed and is often difficult to eliminate.

Sour dock may be cooked as a vegetable or it may be added to a salad for tartness. It flowers from April to August, and fruits until October.

1b. *Rumex acetosella* L. f. *integrifolius* Wallr. Sched. Crit. 186. 1822. Fig. 5h.

None of the leaves lobed.



5. *Rumex acetosella* (Sour Dock; Sheep Sorrel). *a.* Pistillate plant, $\times 1$. *b.* Pistillate flower, $\times 20$. *c.* Staminate plant, $\times 1$. *d.* Staminate flower, $\times 25$. *e.* Sepal of staminate flower, $\times 40$. *f.* Fruit, $\times 25$. *g.* Ocrea, $\times 5$. *forma integrifolius* (Unlobed Sour Dock). *h.* Leaf, $\times 3$.



COMMON NAME: Unlobed Sour Dock.

HABITAT: Waste ground.

RANGE: Native of Europe; sparingly adventive throughout the United States.

ILLINOIS DISTRIBUTION: Known only from Kane County.

This uncommon leaf variant is scarcely worthy of recognition.

2. *Rumex hastatulus* Baldw. ex Ell. Bot. S.C. & Ga. 1:416. 1817. Fig. 6.

Rumex engelmanni Meisn. in DC. Prodr. 14:64. 1856.

Perennial dioecious herbs from a woody rootstock; stems erect, branched or unbranched, glabrous, rarely as much as 1 meter tall; leaves oblong to oblanceolate, often hastate, to 12 cm long, glabrous, the terminal lobe obtuse to acute, the lateral lobes divergent, sometimes unequal in size, with an acidic taste, on petioles often as long as or longer than the blades, the ocreae shredding, silvery; inflorescence a series of erect, interrupted racemes; flowers unisexual, nodding, on jointed pedicels to 3 mm long; outer sepals green, in the staminate flowers obovate-oblong, 1.2–1.6 mm long, in the pistillate flower narrower, reflexed, 0.8–0.9 mm long; inner sepals green, in the staminate flowers broadly obovate, 1.5–2.5 mm long, in the pistillate flower orbicular, cordate, becoming 2.5–3.5 mm long in fruit; stamens 6, exserted; achene to 1.5 mm long, reddish-brown, with the inner calyx persisting as reticulate, pink valves.



COMMON NAME: Sour Dock.

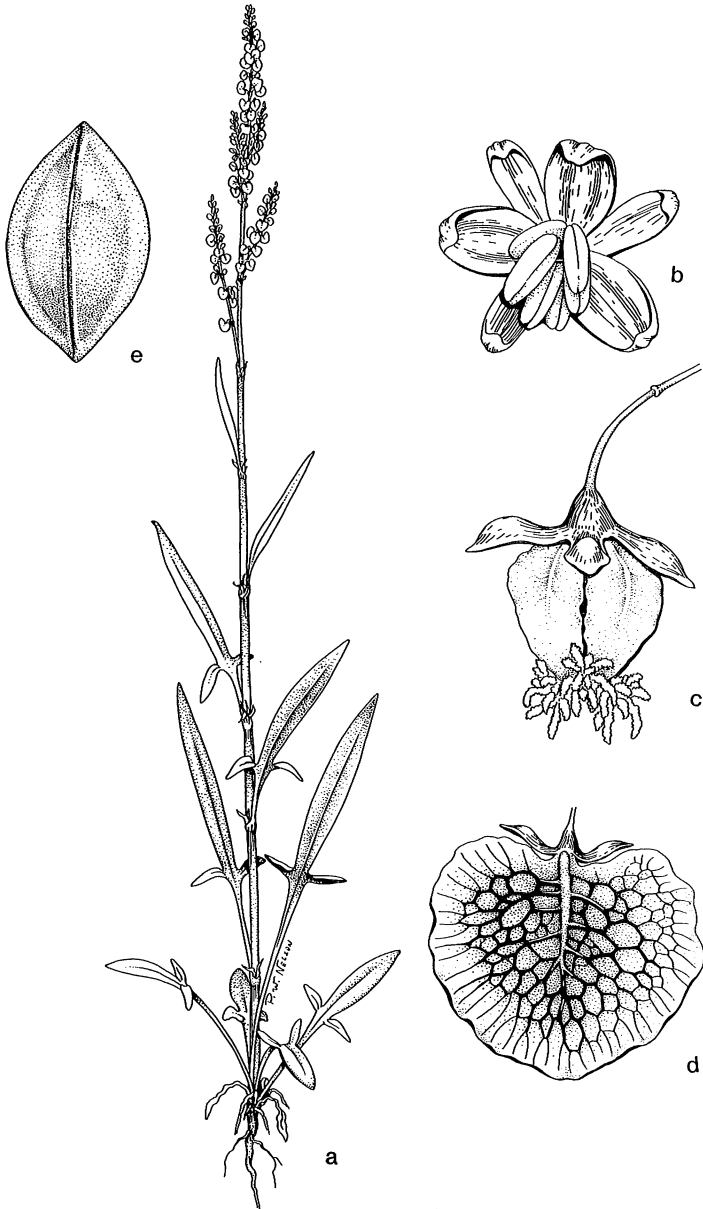
HABITAT: Sandy soil.

RANGE: Along the coast from Massachusetts to Florida to Texas; inland from Illinois to Kansas.

ILLINOIS DISTRIBUTION: Known only from Madison and St. Clair counties.

Because of its hastate leaves and slender inflorescence, this species resembles *R. acetosella* from which it differs by its enlarged inner sepals in fruit and by its woody taproot.

This species exhibits two ranges. Its occurrence along the coast is fairly common, particularly from North Carolina to Flor-



6. *Rumex hastatulus* (Sour Dock). *a.* Habit, $\times 1$. *b.* Staminate flower, $\times 25$. *c.* Pistillate flower, $\times 35$. *d.* Fruit, $\times 45$. *e.* Achene, $\times 50$.

ida and across to Texas. At its inland localities in Kansas, southern Missouri, and Illinois, it is rare. The earliest collection of this species in Illinois was made by George Engelmann from St. Clair County in 1842.

This species flowers during April and May, but persists in fruit until August.

3. **Rumex longifolius** DC. Fl. Fr. Suppl. 368. 1815. *Fig. 7.*

Perennial herb from a thickened root; stems ascending to erect, branched or unbranched, brownish or greenish, usually smooth, up to 1.2 m tall; basal leaves somewhat fleshy, ovate to lanceolate, gradually tapering to the tip, undulate-crisped along the margin, glabrous or with fine papillae on the nerves below, the lateral veins arising from the main vein at an angle of 45° – 60° , up to 35 cm long, up to 10 cm broad, on slender, grooved petioles shorter than blades; stem leaves smaller and narrower, lanceolate; inflorescence sometimes occupying as much as half the length of the plant; flowers perfect, on filiform pedicels up to $2\frac{1}{2}$ times longer than the calyx, the pedicels jointed; valves 4.5–6.0 mm long, 6–8 mm broad, entire or irregularly crenate; grains absent, although thickened swellings may occur; achene dark brown, 2.5–3.0 mm long, pointed at both ends.



COMMON NAME: Dock.

HABITAT: Waste ground.

RANGE: Native of Europe; rarely adventive in the United States.

ILLINOIS DISTRIBUTION: Known from Peoria and Richland counties.

This species differs from all other species of *Rumex* in the state by lacking grains on the fruiting valves.

Rumex longifolius blooms during the summer.

4. **Rumex maritimus** L. var. **fueginus** (Phil.) Dusén, Sv. Exped. Magell. 3, no. 5:194. 1900. *Fig. 8.*

Rumex fueginus Phil. Anal. Univ. Chile 91:493. 1895.

Annual from fibrous roots; stems ascending to erect, hollow, unbranched or much branched, usually puberulent, to 75 cm long; leaves narrowly lanceolate, acute at the apex, subcordate to truncate to tapering to the base, more or less crisped along the margins, rather thick and fleshy, to 25 cm long, puberulent on the lower

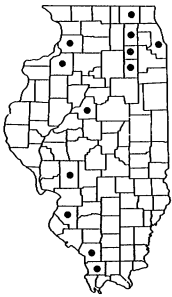


7. *Rumex longifolius* (Dock). a. Lower leaf, $\times 1$. b. Flowering branch, $\times 1$. c. Flower, $\times 10$. d. Fruiting branch, $\times 1$. e. Fruit, $\times 15$. f. Achene $\times 60$.



8. *Rumex maritimus* var. *fueginus* (Golden Dock). a. Habit, $\times \frac{1}{2}$. b. Flower, $\times 10$. c. Fruit, $\times 10$. d. Achene, $\times 40$.

surface, on petioles up to 6 cm long; inflorescence a large, much-branched panicle with interrupted verticils, the inflorescence sometimes extending nearly to the base of the plant and further interrupted by leaves; flowers perfect, on pedicels 4–5 mm long, the pedicels jointed near the base; valves ovate to deltoid, 2–3 mm long, with 1–3 bristles on each margin, the bristles 2–4 mm long; grains 3, lanceoid; achene reddish-brown, 1.3–1.5 mm long, smooth, shiny, angular.



COMMON NAME: Golden Dock.

HABITATE: Sandy shores and muddy banks.

RANGE: Quebec to British Columbia, south to California, New Mexico, Arkansas, and New Jersey; also said to be a native in South America.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

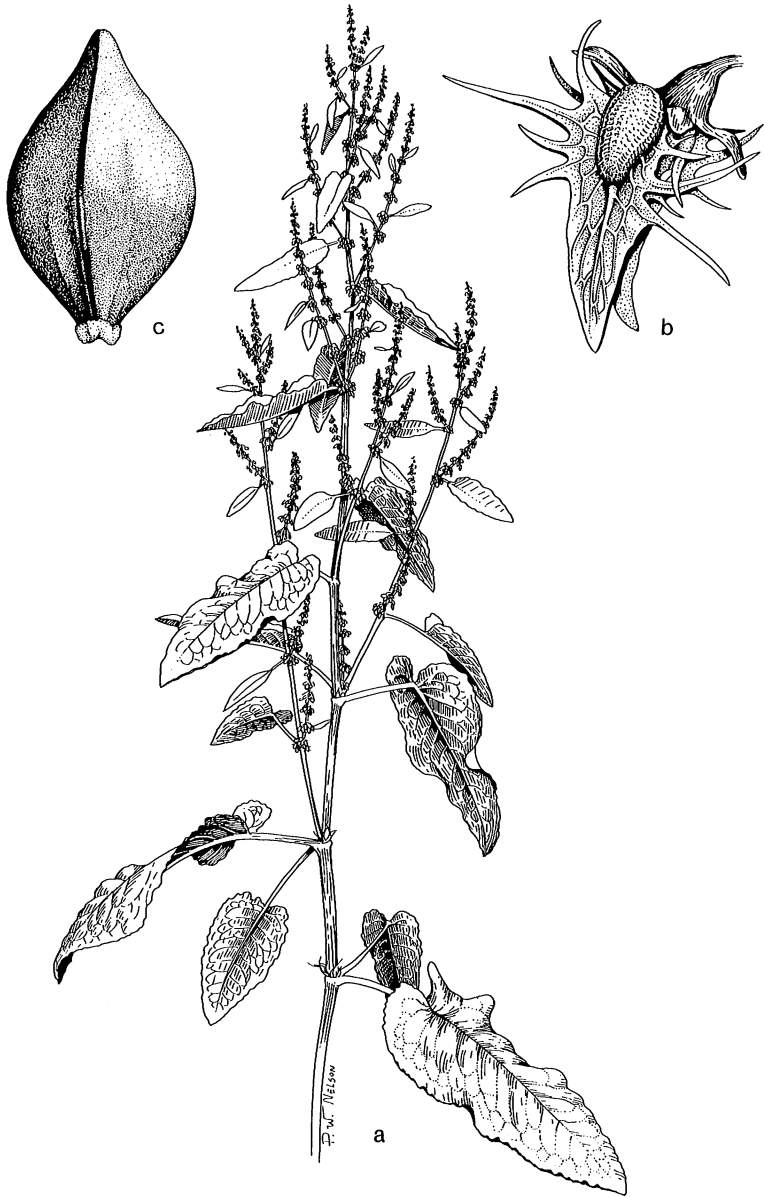
This variety is separated from the typical European variety by its more crisped leaves and its subcordate to truncate leaves. It also differs from *R. persicarioides*, with which it was formerly confused, by its narrower, smaller grains and the longer bristles of the valves.

This species is found primarily along the major rivers and, in the Chicago area, in saline areas around industries.

Golden dock flowers from May to July and fruits until October.

5. *Rumex obtusifolius* L. Sp. Pl. 335. 1753. Figs. 9, 10.

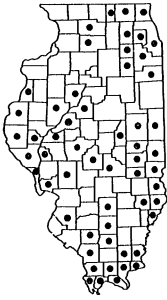
Perennial herb from a thickened rootstock; stems erect, branched or unbranched, glabrous but rough to the touch, to 1 (–1.2) m tall; leaves puberulent on the veins, the lower leaves oblong to ovate, obtuse to acute at the apex, cordate to rounded at the base, more or less crisped along the margin, to 30 cm long, to 15 cm broad, the petioles about as long as the blades, the upper leaves lanceolate to lance-oblong, acute at the apex, tapering or rounded at the base, to 10 cm long, to 4 cm broad, the petioles shorter than the blades; inflorescence an open panicle with interrupted, leafy bracted verticils; flowers perfect or unisexual, on pedicels 4–7 mm long, the pedicels jointed below the middle; valves deltoid to ovate, 3–5 mm long, veiny, with several prominent marginal spiny teeth; grain 1, oblongoid; achene reddish-brown, 1.0–1.5 mm long, smooth, shiny, angular.



9. *Rumex obtusifolius* (Bitter Dock). a. Upper part of plant, $\times \frac{1}{2}$. b. Fruit, $\times 15$. c. Achene, $\times 60$.



10. *Rumex obtusifolius* (Bitter Dock). *d.* Lower leaf, $\times 1$. *e.*, *f.* Pistillate flower, side view, $\times 10$. *g.* Pistillate flower, face view, $\times 10$. *h.* Perfect flower, $\times 10$.



COMMON NAME: Bitter Dock.

HABITAT: Fields, along streams, waste ground.

RANGE: Native of Europe; adventive in much of the United States and Canada.

ILLINOIS DISTRIBUTION: Occasional throughout the state.

This species differs from all other species of *Rumex* in Illinois by its spinulose valves and the presence of only one grain per fruit.

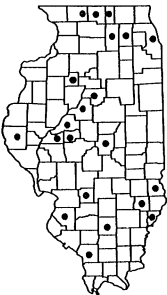
The veins of the lower leaves are often red.

One of the most common habitats for this species is in disturbed floodplain woods. It also may be found in cultivated fields.

Bitter dock flowers in April and May, but may persist in fruit until September.

6. *Rumex patientia* L. Sp. Pl. 353. 1753. Fig. 11.

Perennial herb from a thickened root; stems erect, usually unbranched, glabrous, to 1.5 m tall; leaves glabrous, the lower leaves lance-oblong to lance-ovate, acute to subacute at the apex, truncate to cordate at the base, flat or barely crisped along the margin, to 35 cm long, to 15 cm broad, the petioles often about as long as the blades, the upper leaves lanceolate, acute at the apex, tapering to the base, to 12 cm long, to 5 cm broad, the petioles shorter than the blades; inflorescence a dense panicle with a few leafy bracts at the base; flowers perfect, on pedicels up to 1 cm long, the pedicels jointed near the base; valves broadly ovate to orbicular, 6–8 mm long, veiny, without spinulose marginal teeth; grain 1, ovoid, 2–3 mm long; achene pale brown, 2.5–3.5 mm long, smooth, shiny, angular.



COMMON NAME: Patience Dock.

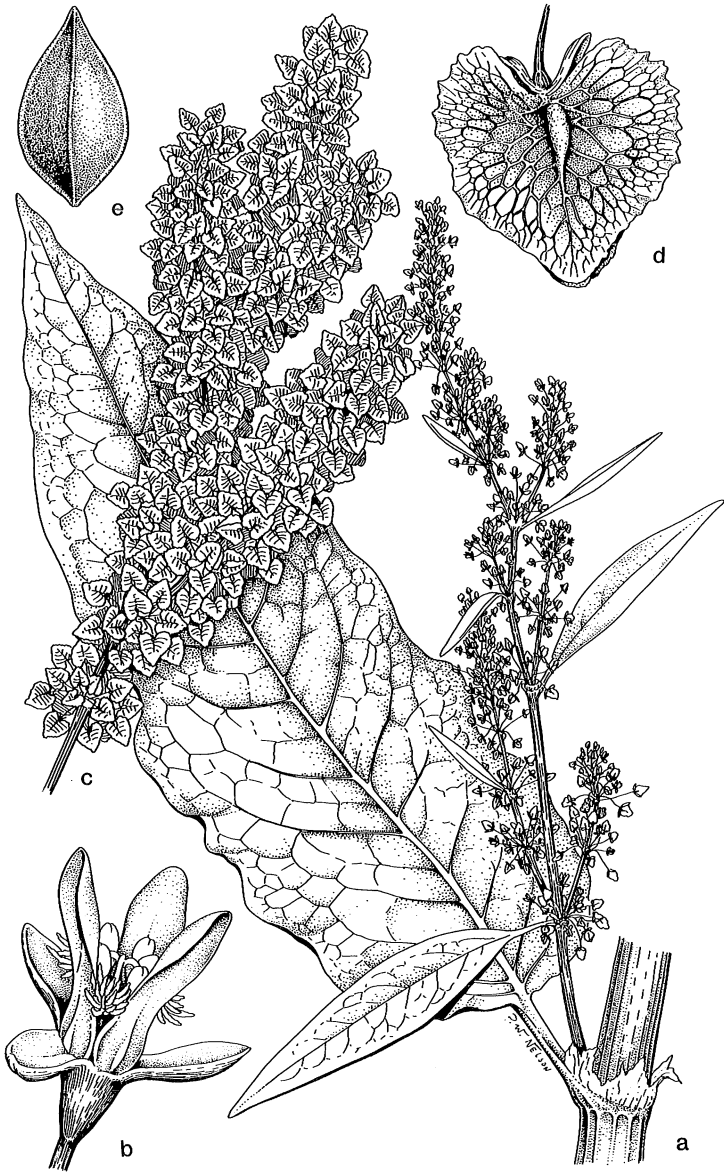
HABITAT: Waste ground.

RANGE: Native of Europe and Asia; adventive throughout most of the United States.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

This coarse weed is distinguished by its very large leaves and valves, its lack of spinulose teeth on the valve margins, and the presence of a single grain per fruit.

The young leaves may be cooked as greens.



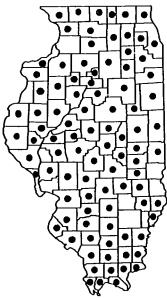
11. *Rumex patientia* (Patience Dock). a. Segment of main stem, leaf, and flowering branch, $\times 1$. b. Flower, $\times 10$. c. Fruiting cluster, $\times 1$. d. Fruit, $\times 10$. e. Achene, $\times 20$.

This species flowers from April to June and continues to fruit until August.

7. *Rumex crispus* L. Sp. Pl. 335. 1753. Figs. 12, 13.

Rumex elongatus Guss. Pl. Rar. Neap. 150. 1826.

Perennial herb from a thickened root; stems erect, usually unbranched, glabrous, to 1.5 m tall; leaves glabrous, strongly crisped along the margin, the lower leaves oblong to lance-oblong, acute to subacute at the apex, rounded to subcordate at the base, to 30 cm long, to 6 cm broad, the petioles often nearly as long as the blades, the upper leaves lanceolate, acute at the apex, usually subcordate at the base, to 12 cm long, to 3 cm broad, the petioles shorter than the blades; inflorescence an open panicle, with rather crowded verticils of flowers interspersed with several linear leaflike bracts; flowers perfect or unisexual, on recurved pedicels to 1 cm long, the pedicels jointed near the base; valves orbicular to broadly ovate, 4–6 mm long, entire or minutely toothed along the margins; grains usually 3, rarely 1, ovoid, 2–3 mm long; achene dark brown, 1.3–1.5 mm long, smooth, shiny, angular.



COMMON NAME: Curly Dock.

HABITAT: Fields, damp disturbed soils, waste ground.

RANGE: Native of Europe; adventive throughout the United States and Canada.

ILLINOIS DISTRIBUTION: Undoubtedly in every county.

This is the most common erect species of *Rumex* in Illinois.

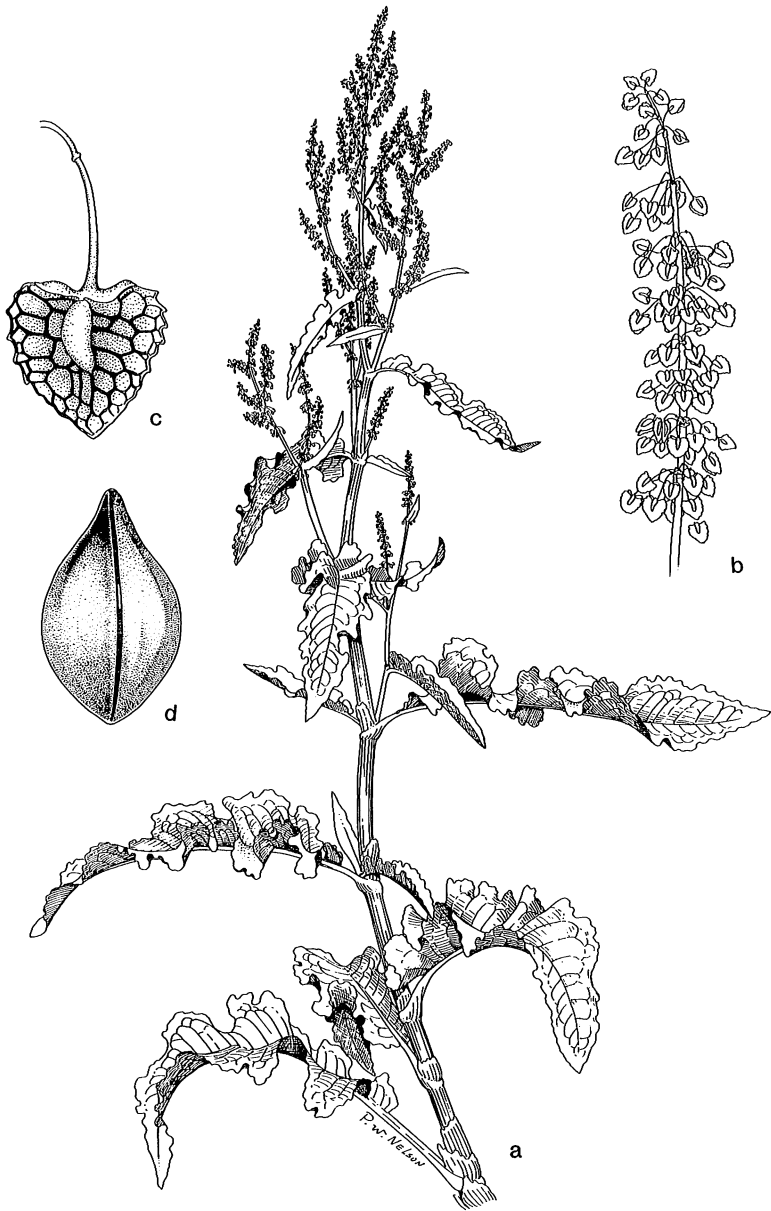
It has the most crisped-margined leaves of any species in the state.

Specimens with rather slender, elongated inflorescences have been referred to *R. elongatus*, but these two taxa are generally considered to be the same species.

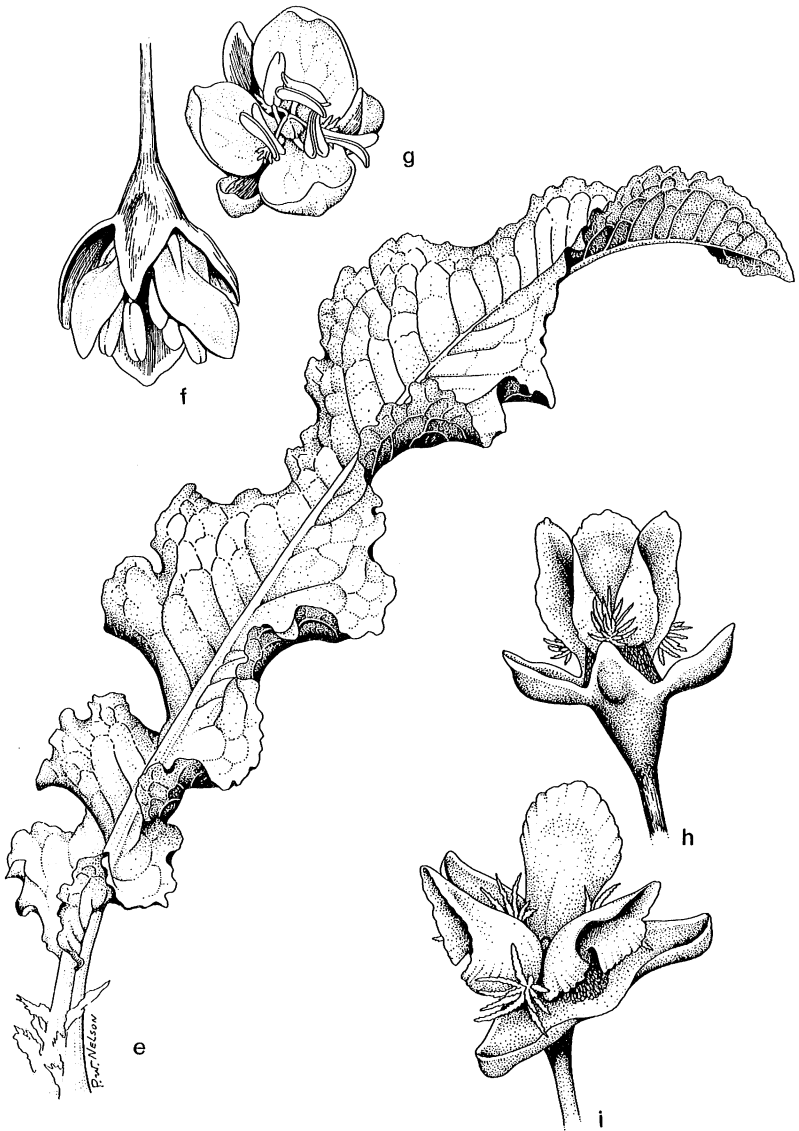
Curly dock flowers during April and May. It fruits until August.

8. *Rumex altissimus* Wood, Class-book 477. 1847. Fig. 14.

Perennial herb from a thickened root; stems erect, branched or unbranched, glabrous, pale green, to 1.5 m tall; leaves glabrous, pale green, not crisped along the margin, the lower leaves oblong-lanceolate to ovate-lanceolate, acute at the apex, tapering or rounded at the base, to 15 cm long, to 5.5 cm broad, the petioles usually shorter than the blades, the upper leaves lanceolate, acute



12. *Rumex crispus* (Curly Dock). *a.* Upper part of plant, $\times 1$. *b.* Fruiting branch, $\times 1\frac{1}{2}$. *c.* Fruit, $\times 10$. *d.* Achene, $\times 50$.



13. *Rumex crispus* (Curly Dock). *e.* Leaf, $\times 1$. *f.*, *g.* Perfect flowers, $\times 10$. *h.*, *i.* Pistillate flowers, $\times 10$.



14. *Rumex altissimus* (Pale Dock). a. Upper part of plant, $\times 1$. b. Staminate flower, $\times 10$. c. Pistillate flower, $\times 10$. d. Sepal, pistillate flower, $\times 15$. e. Fruiting branch, $\times 1$. f. Fruit, $\times 10$.

to acuminate at the apex, tapering to the base, to 10 cm long, to 3 cm broad, the petioles much shorter than the blades; inflorescence paniculate, with crowded, usually bractless verticils of flowers; flowers perfect or unisexual, on pedicels to 5 mm long, the pedicels jointed near the base; valves orbicular to ovate, 4–6 mm long, entire along the margins; grain usually 1, less commonly 3, ovoid, 2–3 mm long; achene dark reddish-brown, 2.0–2.8 mm long, smooth, shiny, angular.



COMMON NAME: Pale Dock.

HABITAT: Swamps, wet, disturbed soil.

RANGE: New York to Minnesota, south to Colorado, Texas, and Georgia; apparently adventive in New England.

ILLINOIS DISTRIBUTION: Occasional to common throughout the state.

This pale green, smooth species is a common inhabitant of moist soil.

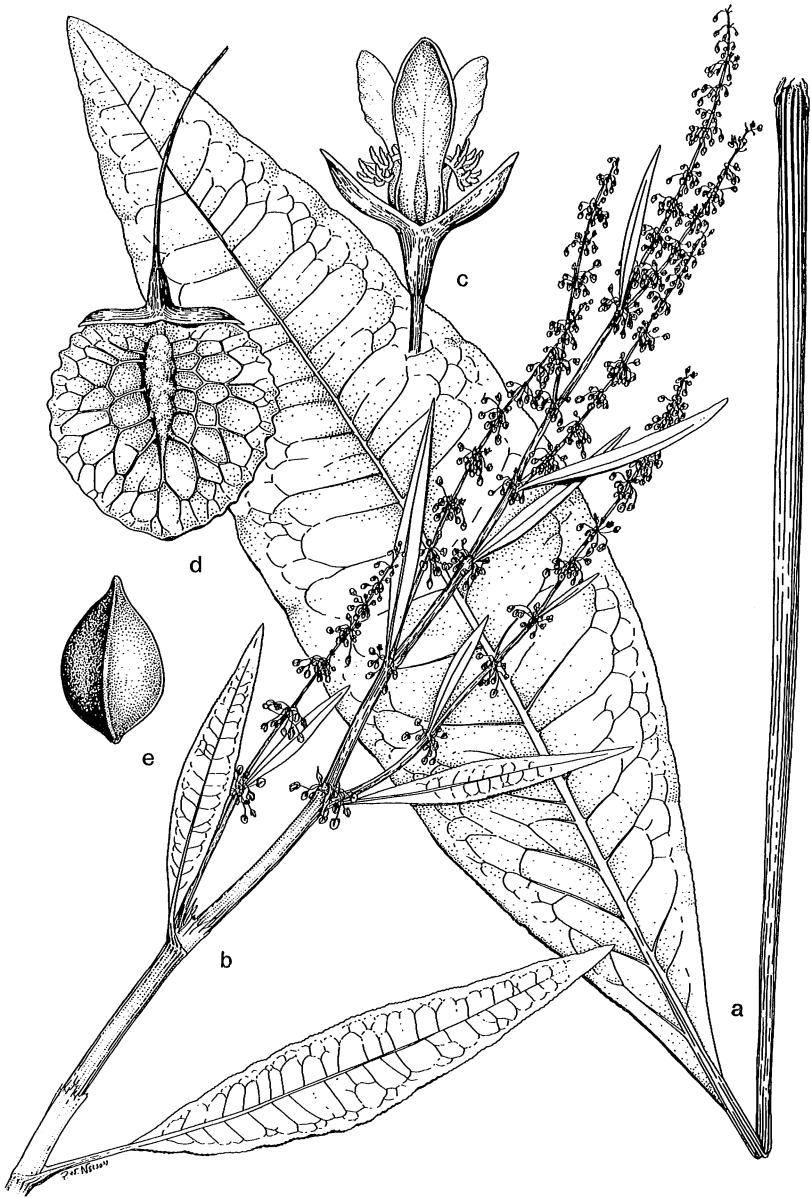
The presence of a single grain per fruit and the flat, pale leaves serve to distinguish this species. Occasional fruits with three grains may be found.

Pale dock flowers during April and May and fruits from June to September.

9. *Rumex orbiculatus* Gray, Man. Bot., ed. 5, 420. 1867.

Fig. 15.

Perennial herb from a thickened root; stems erect, branched or unbranched, glabrous, to 2 m tall; leaves glabrous, crenulate along the margin, the lateral veins at right angles to the main vein, the lower leaves oblong-lanceolate, subacute to acute at the apex, tapering to the base, to 30 cm long, to 15 cm broad, the petioles usually as long as the blades, the upper leaves lanceolate, acute at the apex, tapering to the base, to 15 cm long, to 6 cm broad, the petioles shorter than the blades; inflorescence paniculate, the racemes crowded, with few leaflike bracts; flowers perfect, on pedicels to 1 cm long, the pedicels obscurely jointed near the base; valves orbicular to ovate, 5–8 mm long, veiny, usually denticulate along the margins; grains 3, lanceoloid, 2–4 mm long; achene brown, 5–8 mm long, smooth, shiny, angular.



15. *Rumex orbiculatus* (Water Dock). a. Lower leaf, $\times 1$. b. Upper part of plant with flowers, $\times 1$. c. Flower, $\times 10$. d. Fruit, $\times 15$. e. Achene, $\times 60$.



COMMON NAME: Water Dock.

HABITAT: Along streams, in marshes and ditches, sometimes in standing water.

RANGE: Newfoundland to North Dakota, south to Nebraska, Illinois, Ohio, Pennsylvania, and New Jersey.

ILLINOIS DISTRIBUTION: Occasional to common in the northern three-fifths of the state, absent elsewhere except for Hamilton County.

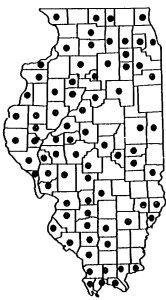
This coarse, wetland species has flat, crenulate leaves, denticulate valves, and three grains per fruit.

Most early Illinois botanists referred to this species as *R. britannica*, which is a different species.

Water dock flowers during April and May and fruits until August.

10. *Rumex verticillatus* L. Sp. Pl. 334. 1753. Fig. 16.

Perennial herb from a thick, deep root; stems erect, unbranched, glabrous, to 1 (-1.2) m tall; leaves glabrous, flat, the lower leaves oblong to broadly lanceolate, obtuse to acute at the apex, tapering to the base, to 30 cm long, to 8 cm broad, the petioles usually as long as or longer than the blades, the upper leaves lanceolate to linear-lanceolate, acute at the apex, tapering to the base, to 12 cm long, to 3 cm broad, the petioles usually shorter than the blades; inflorescence paniculate, with ascending racemes, the verticils interrupted, with few leaflike bracts; flowers perfect, on reflexed pedicels to 1.5 cm long, the pedicels jointed near the base; valves deltoid to ovate, 3-5 mm long, somewhat veiny, entire along the margins; grains 3, lanceoloid, 2.0-3.5 mm long; achene reddish-brown, 1.2-1.8 mm long, smooth, shiny, angular.



COMMON NAME: Swamp Dock.

HABITAT: Swamps, marshes, wet woods.

RANGE: Quebec to Minnesota, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Occasional to common throughout the state.

This species is recognized by its strongly interrupted verticils of flowers and its elongated pedicels.

Swamp dock is a wetland species that frequently grows in standing water.

This species flowers from April to June, with fruits persisting until September.



16. *Rumex verticillatus* (Swamp Dock). a. Upper part of plant, $\times 1$. b. Flower, $\times 10$. c. Fruit, $\times 20$. d. Achene, $\times 50$.

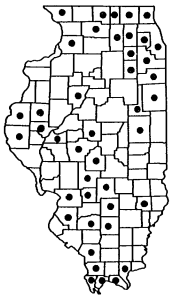
11. *Rumex mexicanus* Meisn. in DC. Prodr. 14:45. 1856.

Fig. 17.

Rumex salicifolius Hook. var. *triangulivalvis* Danser, Nederl. Kruidk. Archief. 1925:415. 1926.

Rumex triangulivalvis (Danser) Rech. f. Repert. Sp. Nov. 40:297. 1936.

Perennial herb from a thickened root; stem erect to ascending, branched or unbranched, glabrous, to 1 m tall; leaves glabrous, flat, the lower leaves oblong to oblong-lanceolate, acute at the apex, tapering to the base, to 20 cm long, to 3 cm broad, the petioles usually as long as or longer than the blades, the upper leaves lanceolate, acute or acuminate at the apex, tapering to the base, to 15 cm long, to 3 cm broad, the petioles usually shorter than the blades; inflorescence paniculate, densely flowered, with few leaflike bracts; flowers perfect or unisexual, on pedicels up to 4 mm long, the pedicels jointed near the base; valves deltoid, 3–6 mm long, veiny, entire to undulate along the margins; grains 3, ellipsoid to lanceoid, 2–4 mm long; achene dark red, 1.5–2.2 mm long, smooth, shiny, angular.



COMMON NAME: Dock.

HABITAT: Moist soil.

RANGE: Newfoundland to British Columbia, south to California, Texas, Missouri, Ohio, and Pennsylvania; adventive in New England.

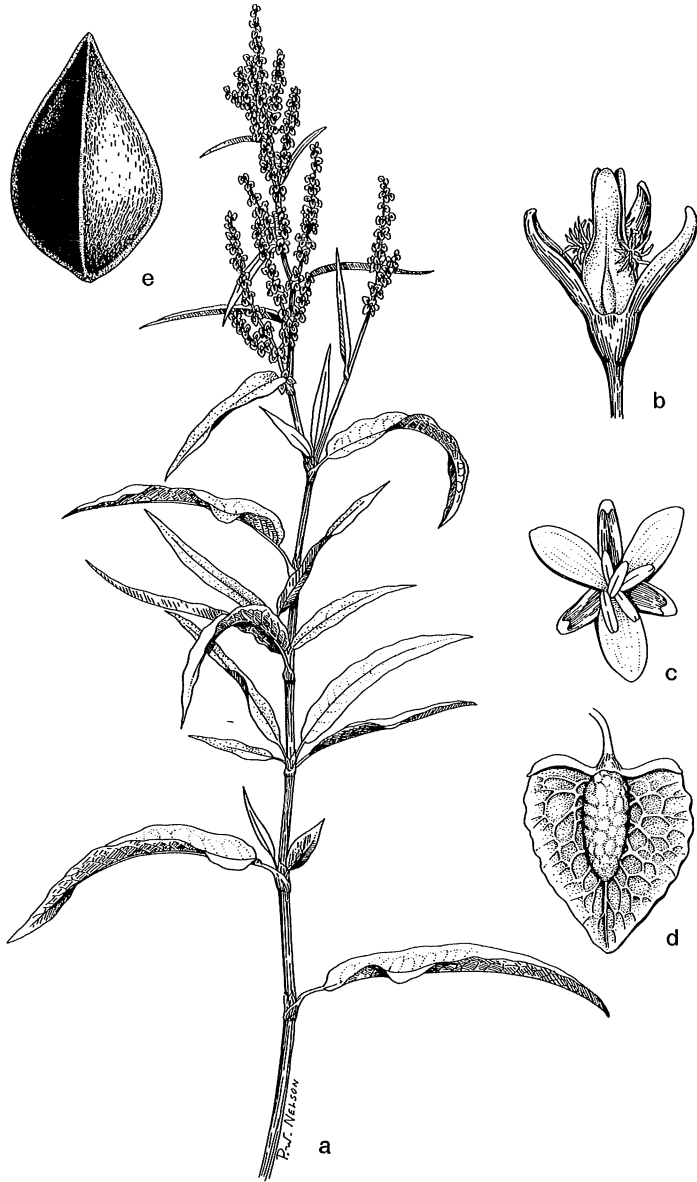
ILLINOIS DISTRIBUTION: Scattered throughout the state.

This very narrow-leaved species occurs in a wide variety of moist soils throughout the state. It has very triangular valves. Some botanists give it the binomial *R. triangulivalvis*.

The flowers are borne in April and May, while the fruits mature from June to September.

12. *Rumex cristatus* DC. Cat. Hort. Monsp. 139. 1813. Fig. 18.

Perennial herb from a thickened root; stems upright, grooved, usually smooth, up to 1.2 m tall; leaves more or less fleshy, the lower leaves ovate-lanceolate, sometimes cordate at the base, gradually tapering to the tip, up to 30 cm long, up to 15 cm broad, smooth, entire, the lateral veins arising from the main vein at an angle of 60°–70°, the petioles about half as long as the blades, the stem



17. *Rumex mexicanus* (Dock). a. Upper part of plant, $\times 1$. b. Pistillate flower, $\times 10$. c. Staminate flower, $\times 10$. d. Fruit, $\times 10$. e. Achene, $\times 40$.

leaves smaller and narrower; flowers perfect, on jointed pedicels $1\frac{1}{2}$ –2 times longer than the calyx; valves 6–8 mm long, 6–7 mm broad, irregularly toothed with the teeth up to 1 mm long; grains 3, 2–3 mm long; achene 3.0–3.2 mm long.



COMMON NAME: Crested Dock.

HABITAT: Waste ground.

RANGE: Native of Europe; rarely adventive in the United States.

ILLINOIS DISTRIBUTION: Known from Macon, Madison, St. Clair, and Stark counties.

This species resembles *R. patientia*, differing in having 3 grains per fruit, rather than 1 in *R. patientia*.

The flowers appear during the summer.

5. *Fagopyrum* Mill.—Buckwheat

Annual or perennial herbs; leaves alternate, entire, ocreate; inflorescence of terminal and axillary paniculate racemes; flowers small, perfect; calyx 5-parted, petaloid, persistent on the fruit; stamens 8; ovary superior, 3-angled, 1-locular, with 1 ovule, the style 3-parted; fruit a 3-angled achene.

Two Eurasian species comprise the genus.

Only the following species has been found in Illinois.

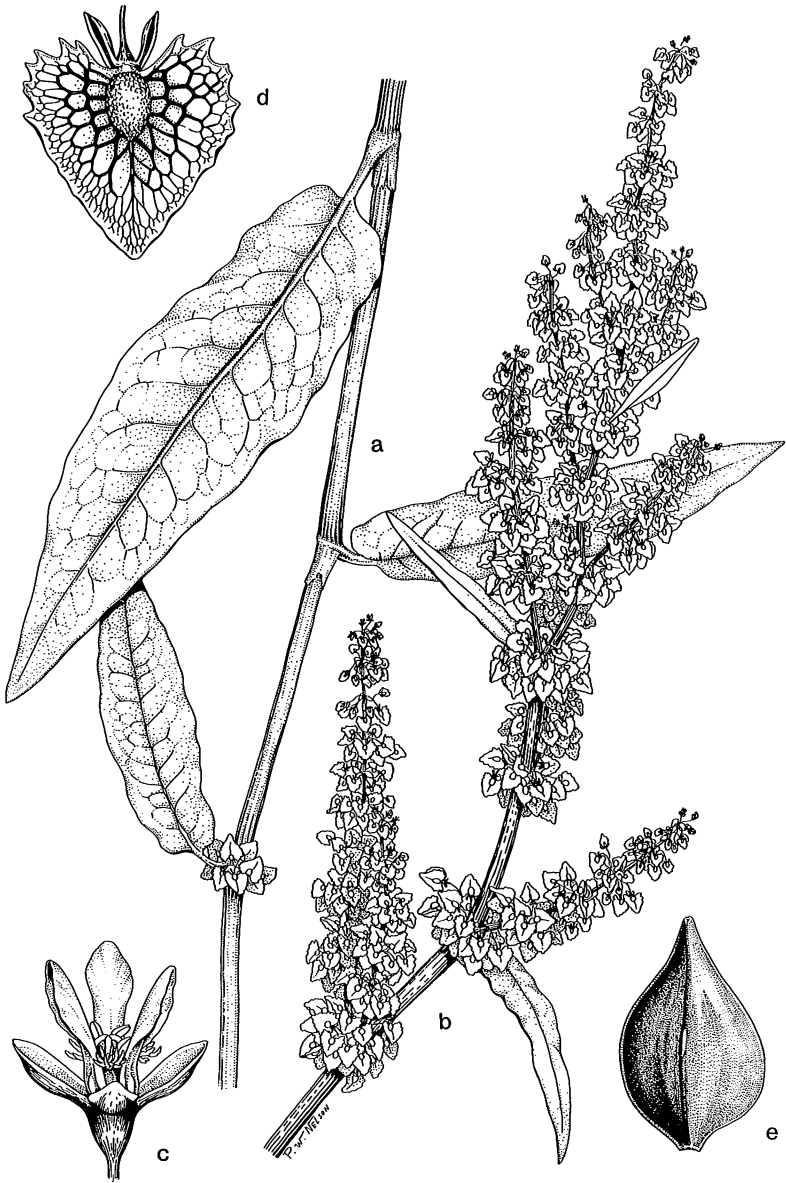
1. *Fagopyrum esculentum* Moench. Meth. Pl. 290. 1794. *Fig.* 19.

Polygonum fagopyrum L. Sp. Pl. 364. 1753.

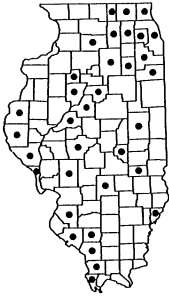
Fagopyrum sagittatum Gilib. Exer. Phyt. 2:435. 1792, *nomen illeg.*

Fagopyrum fagopyrum (L.) Karst. Deutsch. Fl. 522. 1881.

Annual from slender roots; stems erect, glabrous or pubescent near the nodes, grooved, to 1 m tall; leaves hastate to deltoid, entire, acuminate at the apex, truncate to subcordate at the base, glabrous, to 7.5 cm long, nearly as broad, the lower on petioles longer than the blades, the upper sessile or nearly so; ocreae brittle, truncate; inflorescence crowded, the flowers small, perfect, bracteate; calyx 5-parted, the segments elliptic, obtuse, white, 2–3 mm long; stamens 8, included; achene triangular, 5.5–7.0 mm long, smooth, striate, shiny, angulate.



18. *Rumex cristatus* (Crested Dock). *a.* Stem with middle leaves, $\times 1$. *b.* Fruiting branches, $\times 1$. *c.* Flower, $\times 10$. *d.* Fruit, $\times 15$. *e.* Achene, $\times 60$.



COMMON NAME: Buckwheat.

HABITAT: Waste ground, seldom persisting.

RANGE: Native of Europe and Asia; escaped from cultivation throughout most of the United States.

ILLINOIS DISTRIBUTION: Scattered throughout Illinois.

Buckwheat has been cultivated for many centuries and often escapes to roadsides and fields. It rarely persists, however.

The first part of the generic name, *Fago*, is derived from *Fagus*, the Latin name for the beech tree, because of the similarly shaped triangular achenes that both

plants possess.

Buckwheat flowers from May to September.

6. *Polygonum* L. —Smartweed; Knotweed

Annual or perennial herbs (in our area) or shrubs, sometimes climbing; leaves alternate, entire, ocreate, the ocreae sometimes with bristles; inflorescence paniculate, spicate, or solitary in the axils of the leaves; flowers perfect or unisexual, subtended by an ocreola when borne in panicles or spikes; calyx 4- to 6-parted, often petaloid, persistent on the achene; petals absent; stamens 3–8 (–9); ovary superior, 1-locular, with 1 ovule, the styles (1–) 2–3, free or united; fruit a lenticular or 3-angled achene.

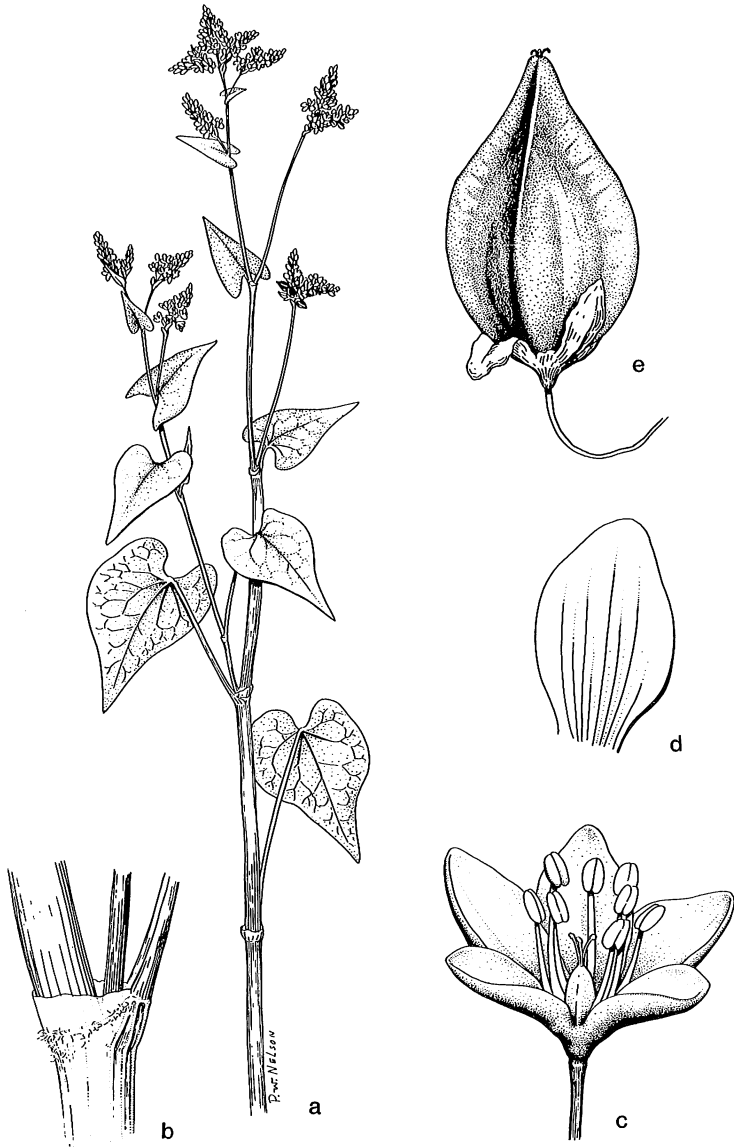
As considered here, the genus is comprised of about 150 species found throughout most of the World. The genus is usually divided into a number of clear-cut divisions which are accorded either sectional or generic status. I prefer to recognize them as sections.

The Illinois species fall into six sections—*Polygonum* (= *Avicularia*), *Persicaria*, *Echinocaulon*, *Tovara*, *Tiniaria*, and *Pleuropterus*. The major features of these sections are summarized below:

SECTION *Polygonum*

1. Flowers in axillary fascicles, with foliaceous bracts.
2. Leaves jointed upon a very short petiole adnate to the short sheath of the stipules.
3. Sepals 5, united at the base.
4. Stamens 3–8 (–9).
5. Styles 3.
6. Achenes 3-angular.
7. Mostly annuals with branched stems.

Illinois Species: *P. tenue*, *P. aviculare*, *P. buxiforme*, *P. prolifi-*



19. *Fagopyrum esculentum* (Buckwheat). *a.* Upper part of plant, $\times 1$. *b.* Ocrea, $\times 5$. *c.* Flower, $\times 25$. *d.* Sepal, $\times 35$. *e.* Achene, $\times 15$.

cum, *P. exsertum*, *P. ramosissimum*, *P. erectum*, *P. achoreum*, *P. ar-
enastrum*, *P. neglectum*.

SECTION **Persicaria**

1. Flowers in terminal and/or axillary racemes, without folia-
ceous bracts.
2. Leaves not jointed on the petioles.
3. Sepals 3–6, united at the base.
4. Stamens 3–8.
5. Styles 2–3.
6. Achenes lenticular or 3-angular.
7. Annual or perennial herbs.

Illinois Species: *P. careyi*, *P. orientale*, *P. punctatum*, *P. hydro-
piper*, *P. persicaria*, *P. cespitosum*, *P. setaceum*, *P. hydropiperoides*,
P. opelousanum, *P. amphibium*, *P. bicornis*, *P. scabrum*, *P. lapathifol-
ium*, *P. pensylvanicum*.

SECTION **Echinocaulon**

1. Inflorescence in subspherical heads or short racemes.
2. Leaves not jointed on the petiole, hastate or sagittate.
3. Sepals 5.
4. Stamens 6–8.
5. Styles 2–3.
6. Achenes lenticular or 3-angular.
7. Stems recurved-prickly.

Illinois Species: *P. sagittatum*, *P. arifolium*.

SECTION **Tovara**

1. Inflorescence a much-interrupted terminal or spikelike ra-
ceme.
2. Leaves not jointed on the petiole.
3. Sepals 4, united at the base.
4. Stamens 5.
5. Styles 2.
6. Achenes lenticular.
7. Perennial herbs, with rhizomes.

Illinois Species: *P. virginianum*.

SECTION **Tiniaria**

1. Inflorescence of axillary or terminal racemes.
2. Leaves not jointed on the petiole.

3. Sepals 5, in 2 series.
4. Stamens 8.
5. Styles 1-3.
6. Achenes 3-angular.
7. Twining or trailing herbs.

Illinois Species: *P. convolvulus*, *P. cristatum*, *P. scandens*.

SECTION Pleuropterus

1. Inflorescence in axillary panicles.
2. Leaves not jointed on the petiole.
3. Sepals 5, in 2 series.
4. Stamens 5-8.
5. Styles 3, fringed.
6. Achenes 3-angular.
7. Stout perennial herbs.

Illinois Species: *P. sachalinense*, *P. cuspidatum*.

KEY TO THE SPECIES OF Polygonum IN ILLINOIS

- | | |
|--|----------------------------|
| 1. Stems reflexed-prickly | 2 |
| 1. Stems not reflexed-prickly | 3 |
| 2. Achenes trigonous; leaves sagittate | 1. <i>P. sagittatum</i> |
| 2. Achenes lenticular; leaves hastate | 2. <i>P. arifolium</i> |
| 3. Stems twining or trailing, neither erect nor prostrate | 4 |
| 3. Stems erect or prostrate | 6 |
| 4. Achenes dull, granular; outer sepals keeled ---- | 3. <i>P. convolvulus</i> |
| 4. Achenes shining, not granular; outer sepals winged | 5 |
| 5. Calyx in fruit up to 10 mm long; achenes up to 3 mm long | |
| | 4. <i>P. cristatum</i> |
| 5. Calyx in fruit more than 10 mm long; achenes more than 3 mm long - | |
| | 5. <i>P. scandens</i> |
| 6. Flowers borne in small axillary clusters | 7 |
| 6. Flowers borne in terminal and/or axillary spikes or racemes--- | 19 |
| 7. Leaves plicate; stems angular | 6. <i>P. tenue</i> |
| 7. Leaves flattened; stems terete or nearly so | 8 |
| 8. Tips of perianth lobes longer than the achene in most flowers, en- | |
| closing the achene at maturity | 9 |
| 8. Tips of perianth equal to or shorter than the achene in most flowers, | |
| not enclosing it completely | 14 |
| 9. Outer perianth lobes cucullate | 10 |
| 9. Outer perianth lobes more or less flat, not cucullate | 13 |
| 10. Leaves linear to lanceolate, at least 4 times longer than broad ---- | |
| | 11. <i>P. ramosissimum</i> |

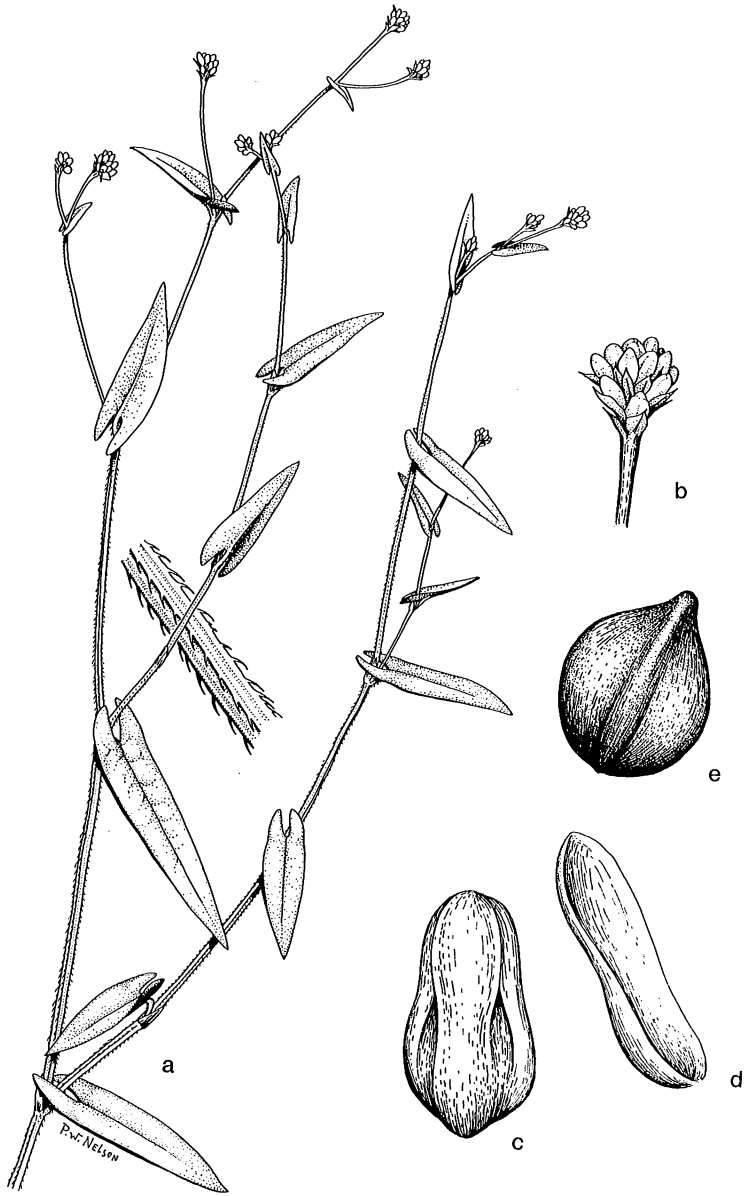
10. Leaves oblong, oval, or obovate, up to 3 times longer than broad _
 ----- 11
11. Upper leaves conspicuously smaller and narrower than lower leaves;
 plants erect or ascending at maturity ----- 12. *P. erectum*
11. All leaves similar in size and shape; plants mat-forming at maturity --
 ----- 12
12. Achenes uniformly papillose, yellow-green to tan; perianth divided
 about $\frac{1}{3}$ its length ----- 13. *P. achoreum*
12. Achenes striate-papillose, chestnut to dark brown; perianth divided
 about $\frac{1}{2}$ or more its length ----- 8. *P. buxiforme*
13. Upper leaves conspicuously smaller and narrower than lower leaves;
 perianth divided to below middle ----- 7. *P. aviculare*
13. All leaves similar in size and shape; perianth divided less than $\frac{1}{2}$ way
 ----- 14. *P. arenastrum*
14. Upper leaves conspicuously smaller than lower leaves; flowers
 mostly restricted to the base of the uppermost leaves ----- 15
14. All leaves similar; flowers at the base of most of the leaves ---- 16
15. Most achenes conspicuously exserted, smooth, pale brown to green --
 ----- 10. *P. exsertum*
15. Most achenes more or less enclosed by the perianth, roughened,
 brown ----- 7. *P. aviculare*
16. Leaves linear to oblanceolate, at least 5 times longer than broad --
 ----- 17
16. Leaves elliptic to ovate, up to 4 times longer than broad ----- 18
17. Leaves oblanceolate, obtuse ----- 9. *P. prolificum*
17. Leaves linear to lanceolate, acuminate ----- 15. *P. neglectum*
18. Outer perianth lobes cucullate, 3.5 mm long or longer, divided
 about $\frac{1}{3}$ their length ----- 13. *P. achoreum*
18. Outer perianth lobes flat, up to 3 mm long, divided about $\frac{1}{2}$ their
 length ----- 14. *P. arenastrum*
19. Outer sepals broadly winged ----- 20
19. Outer sepals unwinged ----- 21
20. Leaves cordate at base ----- 16. *P. sachalinense*
20. Leaves truncate at base ----- 17. *P. cuspidatum*
21. Styles persistent as beaks on the achenes; calyx usually 4-parted ----
 ----- 18. *P. virginianum*
21. Styles deciduous; calyx usually 5-parted ----- 22
22. Ocreae with bristles ----- 23
22. Ocreae without bristles ----- 32
23. Perennials with rhizomes or stolons ----- 28. *P. amphibium*
23. Annuals with fibrous roots ----- 24
24. Peduncles with stipitate glands ----- 19. *P. careyi*

24. Peduncles without stipitate glands ----- 25
25. Apex of ocreae with an expanded rim ----- 20. *P. orientale*
25. Apex of ocreae rimless ----- 26
26. Calyx punctate or glandular-dotted ----- 27
26. Calyx neither punctate nor glandular-dotted ----- 28
27. Racemes usually interrupted; achenes shining ---- 21. *P. punctatum*
27. Racemes mostly continuous; achenes dull ----- 22. *P. hydropiper*
28. Racemes densely crowded; annuals without elongated rootstocks -
----- 29
28. Racemes more or less interrupted; perennials with elongated
rootstocks ----- 30
29. Leaves often with a dark blotch; most or all the spikes at least 7 mm
thick ----- 23. *P. persicaria*
29. Leaves without a dark blotch; most or all the spikes less than 7 mm
thick ----- 24. *P. cespitosum*
30. Leaves strigose on the upper surface; calyx white 25. *P. setaceum*
30. Leaves glabrous or scabrous on the upper surface; calyx mostly pink
or greenish ----- 31
31. Achene completely included; calyx pinkish or rosy -----
----- 26. *P. hydropiperoides*
31. Achene partly exserted; calyx greenish or greenish-purple -----
----- 27. *P. opelousanum*
32. Perennials with rhizomes or stolons ----- 28. *P. amphibium*
32. Annuals with fibrous roots ----- 33
33. Some or all the flowers with long-exserted stamens and styles -----
----- 29. *P. bicornis*
33. None of the flowers with exserted stamens and styles ----- 34
34. Spikes greenish ----- 30. *P. scabrum*
34. Spikes pink or rose or white ----- 35
35. Spikes arching or pendulous; achenes up to 2 mm broad -----
----- 31. *P. lapathifolium*
35. Spikes erect; achenes broader than 2 mm ----- 32. *P. pennsylvanicum*

1. *Polygonum sagittatum* L. Sp. Pl. 363. 1753. Fig. 20.

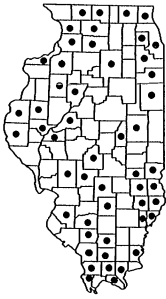
Tracaulon sagittatum(L.) Small, Fl. S.E. U.S. 3981. 1903.

Weak, sprawling annual; stems decumbent, often reclining on other vegetation, 4-angled, reflexed-prickly, to 2 m long; leaves lanceolate to elliptic to oblong, obtuse to acute at the apex, sagittate at the base, roughened along the margins, to 10 cm long, to 2.5 cm broad, short prickly on the main vein below, the lower leaves on short prickly petioles, the upper leaves sessile or nearly so; ocreae



20. *Polygonum sagittatum* (Tear Thumb). *a.* Upper part of plant, $\times 1$. *b.* Inflorescence, $\times 4$. *c.* Sepals, $\times 25$. *d.* Sepal, $\times 30$. *e.* Achene, $\times 25$.

oblique, without apical bristles but with some short prickles near the base; inflorescence of dense, shortened racemes, on long peduncles; calyx 5-parted, pink to white to greenish; stamens 8; style 3-parted; achene 3-angular, dark brown to black, smooth, shining, 2–3 mm long.



COMMON NAME: Tear Thumb.

HABITAT: Swampy ground, marshy ground, burned bogs.

RANGE: Newfoundland to Saskatchewan, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Occasional throughout the state.

Tear thumb often forms dense entanglements as it climbs and leans over existing vegetation. It differs from the similar *P. arifolium* by its sagittate leaves and its 3-angular achenes.

In the northeastern corner of the state, tear thumb quickly invades bogs that have been burned.

This species flowers from June to October.

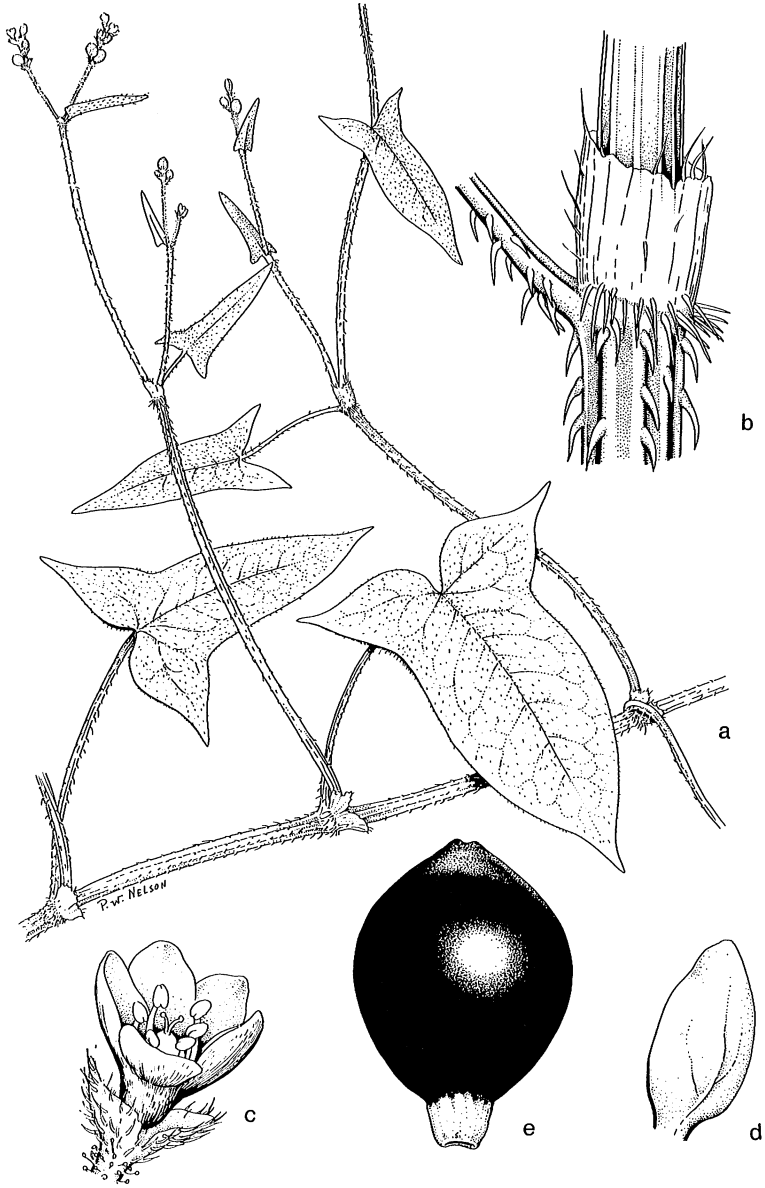
2. *Polygonum arifolium* L. Sp. Pl. 364. 1753. Fig. 21.

Tracaulon arifolium (L.) Raf. Fl. Tell. 3:13. 1836.

Polygonum arifolium L. var. *lentiforme* Fern. & Griseb. Rhodora 37:167. 1935.

Polygonum arifolium L. var. *pubescens* (Keller) Fern. Rhodora 48:53. 1946.

Sprawling perennial; stems decumbent, often reclining on other vegetation, 4-angled, reflexed-prickly, to 2 m long; leaves hastate, acuminate to acute at the apex, truncate at the base, the two hastate lobes acute to acuminate, the leaf to 10 (–20) cm long, to 7 (–15) cm broad, stellate-pubescent, at least below, prickly on the main veins below, the lower on prickly petioles, the upper short-petiolate to subsessile; ocreae oblique, fringed at the apex, bristly near the base; inflorescence of short terminal and/or axillary heads or racemes, on long peduncles; calyx 5-parted, pink to greenish; stamens 6; style 2-parted; achene lenticular, obovoid, dark brown, smooth, shining, 3.0–3.5 mm long.



21. *Polygonum arifolium* (Tear Thumb). *a.* Stem with leaves and flowers, $\times 1$. *b.* Ocrea, $\times 4$. *c.* Flower, $\times 20$. *d.* Sepal, $\times 25$. *e.* Achene, $\times 25$.



COMMON NAME: Tear Thumb.

HABITAT: Wet ground.

RANGE: New Brunswick to Ontario and Minnesota, south to Missouri and Georgia.

ILLINOIS DISTRIBUTION: Known only from Macon and McHenry counties, where it is undoubtedly now extinct.

Both collections of this tear thumb were made in Illinois before 1875. This species apparently is now extinct in Illinois.

3. *Polygonum convolvulus* L. Sp. Pl. 364. 1753. Fig. 22.

Tiniaria convolvulus (L.) Webb & Moq. ex Webb & Berth. Hist. Nat. Iles Canaries 3(2):221. 1836-40.

Reynoutria convolvulus (L.) Shinnars, Sida 3:117. 1967.

Annual from fibrous roots; stems twining or trailing, angled, branched, minutely roughened, to 1 m long; leaves deltoid to ovate, or the uppermost lanceolate, acute to acuminate at the apex, sagittate to cordate at the base, the petioles minutely roughened; ocreae oblique, without bristles; inflorescence of pendulous racemes from the axils of the leaves, the racemes up to 6 cm long; flowers in clusters of (2-) 3-6, on jointed pedicels up to 2 mm long; calyx composed of 5 sepals in 2 series, the sepals greenish, sometimes tinged with purple, puberulent, 1.5-2.5 mm long, becoming up to 5 mm long in fruit; petals absent; stamens 8; styles usually 3; achene 3-angular, black, dull, granular, 3-4 mm long, subtended by the outer three, narrowly keeled sepals.



COMMON NAME: Black Bindweed.

HABITAT: Fields, edge of woods, disturbed ground.

RANGE: Native of Europe; adventive throughout the United States.

ILLINOIS DISTRIBUTION: Occasional to common throughout Illinois.

This species differs from the other climbing, nonprickly taxa of *Polygonum* in Illinois by its keeled outer sepals and its dull, granular achenes.

In times past, the achenes have been ground and used for meal.

Shinnars' suggestion (1967) that this and the other taxa of *Polyg-*



22. *Polygonum convolvulus* (Black Bindweed). *a*. Habit, young flowering plant, $\times 1$. *b*. Seedling, $\times 1$. *c*. Fruiting branch of mature plant, $\times 1$. *d*, *e*. Flowers, $\times 10$. *f*. Sepals, $\times 25$. *g*. Achene, $\times 20$.

onum in section *Tiniaria* be placed in the genus *Reynoutria* is rejected at this time.

This species flowers from May to November.

4. *Polygonum cristatum* Engelm. & Gray, Bost. Journ. Nat. Hist. 5:259. 1847. Fig. 23.

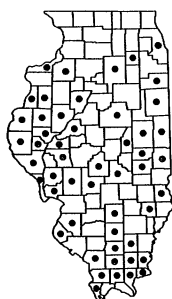
Tiniaria cristata (Engelm. & Gray) Small, Fl. S.E.U.S. 382. 1903.

Polygonum scandens L. var. *dumetorum* Gl. Phytologia 4:23. 1952.

Reynoutria scandens (L.) Shinnery var. *cristata* (Engelm. & Gray) Shinnery, Sida 3:118. 1967.

Bilderdykia cristata (Engelm. & Gray) Greene, Leaflets Bot. Obs. 1:23. 1904.

Perennial; stems twining, angled, branched, minutely roughened, to 4 m long; leaves ovate to deltoid, acute at the apex, cordate to truncate at the base, to 8 (-10) cm long, to 4 (-5) cm broad, glabrous or minutely roughened, the lower on petioles to 2 cm long, the upper becoming sessile or nearly so; ocreae oblique, without bristles; inflorescence of racemes on shortened clusters from the axils of the leaves, the racemes up to 10 cm long; calyx composed of 5 sepals in 2 series, the sepals greenish-white, 1.5-2.5 mm long, becoming up to 10 mm long in fruit; stamens 8; styles usually 3; achene 3-angular, black, shiny, smooth, 2-3 mm long, subtended by the outer three broadly winged sepals, the wings entire or incised.



COMMON NAME: Crested False Buckwheat.

HABITAT: Woodlands, along streams, on bluffs.

RANGE: Vermont to Minnesota, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Common throughout the state.

The taxonomy of this and the following species is confusing and a matter of conjecture.

Some botanists recognize three species in this complex—*P. cristatum*, *P. dumetorum*, and *P. scandens*.

Others recognize these taxa to be three varieties of the same species—*P. scandens* var. *scandens*, *P. scandens* var. *cristatum*, and *P. scandens* var. *dumetorum*. Still others combine *P. dumetorum* with *P. cristatum*, as done in this study, or *P. scandens* var. *dumetorum* with var. *cristatum*.



23. *Polygonum cristatum* (Crested False Buckwheat). *a.* Segment of stem, with leaves and fruits, $\times 1$. *b.* Flower, $\times 20$. *c.* Ocrea, with fruits, $\times 10$. *d.* Achene, $\times 25$.

I am maintaining *P. cristatum* as distinct from *P. scandens* on the basis of fruit size. The fruit never exceeds 10 mm in length in *P. cristatum*, while it usually always exceeds 10 mm in *P. scandens*. In combining *P. dumetorum* with *P. cristatum*, I am considering as insignificant the entire or incised margins of the outer sepals in fruit. *Polygonum dumetorum* is said to have entire wings, while *P. cristatum* has incised wings. However, in *P. scandens*, both entire and incised wings have been observed.

Polygonum cristatum is accepted as the correct binomial, rather than *P. dumetorum*; *P. dumetorum* is actually applicable to a different species.

This species flowers from July to November.

5. *Polygonum scandens* L. Sp. Pl. 364. 1753. Fig. 24.

Polygonum dumetorum L. var. *scandens* (L.) Gray, Man. Bot., ed. 5, 41. 1867.

Tiniaria scandens (L.) Small, Fl. S.E.U.S. 382. 1903.

Reynoutria scandens (L.) Shinnars, Sida 3:118. 1967.

Perennial; stems twining, angled, branched, minutely roughened, to 7 m long; leaves ovate, acuminate at the apex, cordate at the base, to 10 (-12) cm long, to 5 (-6) cm broad, roughened along the margins, the lower on petioles to 2 cm long, the upper becoming sessile or nearly so; ocreae oblique, without bristles; inflorescence of racemes from the axils of the leaves, the racemes to 20 cm long; calyx composed of 5 sepals in 2 series, the sepals greenish-yellow or greenish-white, 1.5-2.5 mm long, becoming 10-15 mm long in fruit; stamens 8; styles 3; achene 3-angular, black, shiny, smooth, 3-5 mm long, subtended by the outer 3 broadly winged sepals, the wings entire or incised.



COMMON NAME: False Buckwheat.

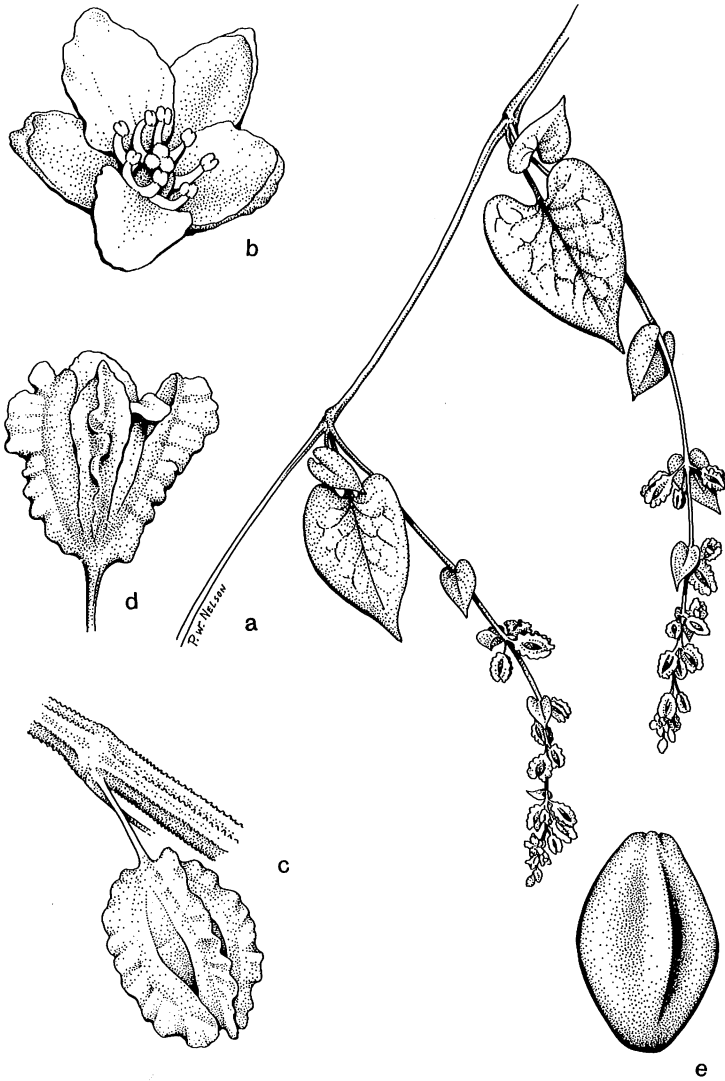
HABITAT: Woods and thickets.

RANGE: Nova Scotia to Manitoba, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Occasional to common throughout the state.

False Buckwheat is a common vine throughout Illinois. It is frequently confused with the climbing *P. cristatum*, but the calyx during fruiting and the achenes are much larger in *P. scandens*.

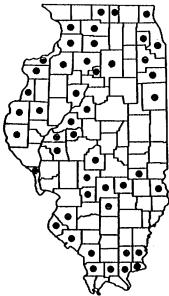
The flowers bloom from August through October.



24. *Polygonum scandens* (False Buckwheat). a. Segment of stem, with leaves and fruit, $\times 1$. b. Flower, $\times 20$. c. Node with fruit, $\times 10$. d. Fruit, $\times 10$. e. Achene, $\times 20$.

6. *Polygonum tenue* Michx. Fl. Bor. Am. 1:238. 1803. Fig. 25.

Annual from slender roots; stems ascending to erect, wiry, branched or unbranched, angular and becoming 4-angled near the base, to 75 cm long; leaves linear to narrowly lanceolate, acute to cuspidate at the apex, cuneate at the base, minutely toothed or entire, plicate, occasionally revolute, with 2 strong veins paralleling the midvein, to 4 cm long, to 8 mm broad, sessile or subsessile; ocreae hyaline, shredded; inflorescence few-flowered, interrupted; flowers on pedicels 1.0–1.5 mm long; calyx 5-parted, petaloid, greenish-brown with white or rose margins, the segments 2.5–4.0 mm long; petals absent; stamens 8; achene 3-angular, ovoid, acute at the apex, black to dark brown, smooth or obscurely striate, 2.5–4.0 mm long, tightly enclosed by the perianth, stipitate.



COMMON NAME: Slender Knotweed.

HABITAT: Dry, sandy soil; crevices in sandstone bluffs.

RANGE: Quebec to Minnesota, south to New Mexico and Georgia.

ILLINOIS DISTRIBUTION: Occasional throughout the state.

This is the only species of section *Polygonum* in Illinois which has plicate leaves and angular stems. It occupies dry, usually sandy, habitats.

The slender knotweed flowers from July through September.

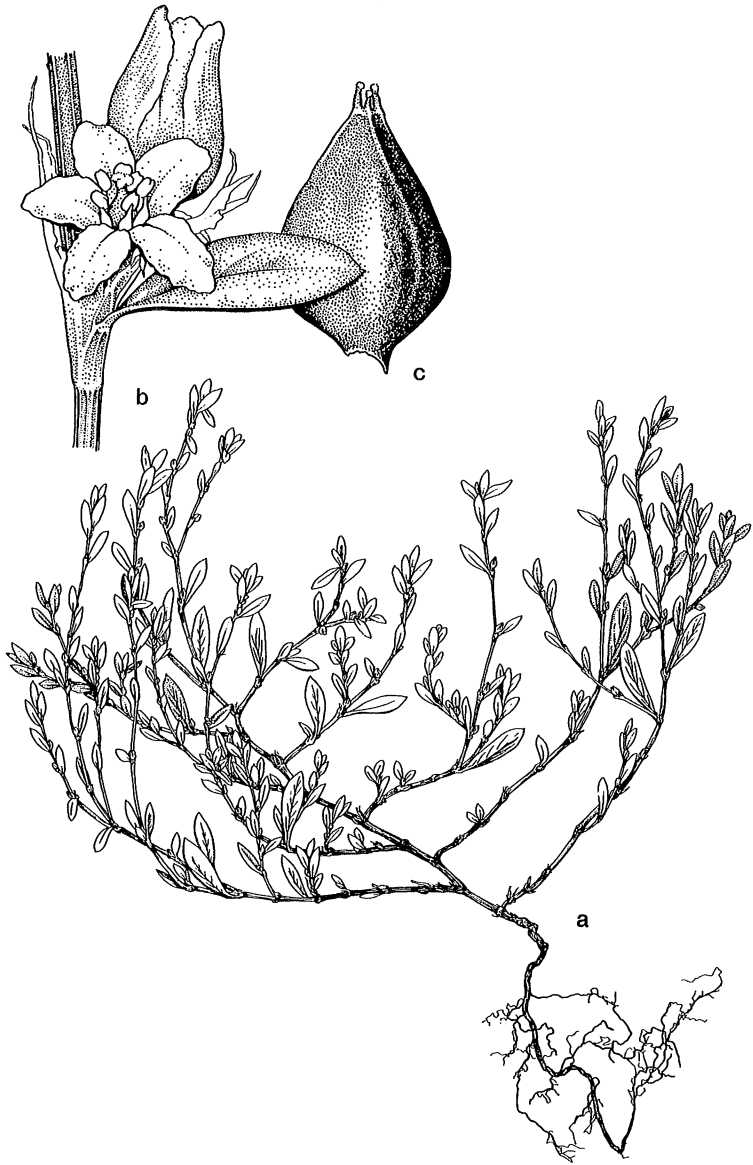
7. *Polygonum aviculare* L. Sp. Pl. 362. 1753. Fig. 26.

Polygonum monspeliense Pers. Syn. 1:439. 1805.

Annual from a wiry taproot; stems prostrate to ascending or erect, branched, slightly grooved, glabrous, to 1.5 m long; leaves gray-green, sessile or subsessile, dimorphic, the earlier, lower leaves lanceolate to ovate-lanceolate, entire, 2.5–6.0 cm long, 4–15 mm broad, the later, upper leaves sharply reduced, linear-lanceolate to lanceolate, entire, to 2 cm long, 1–5 mm broad; ocreae silvery, shredded; inflorescence a cluster of 1–6 flowers borne from the axil of each ocrea; flowers sessile to short-pedicellate; calyx 5-parted, the sepals usually green with pink or white borders, 2.5–3.0 mm long; petals absent; stamens (5–) 8; achene 3-angular, ovoid, acute at the apex, brown, dull, punctate or striate, 2.5–3.0 mm long, stipitate, usually included in the persistent calyx.



25. *Polygonum tenue* (Slender Knotweed). *a.* Habit, $\times 2$. *b.* Ocrea, with young fruit, $\times 15$. *c.* Flower, $\times 18$. *d.* Sepals, $\times 25$. *e.* Achene, $\times 25$.



26. *Polygonum aviculare* (Knotweed). a. Habit, $\times 2$. b. Flowers, $\times 10$. c. Achene, $\times 25$.



COMMON NAME: Knotweed.

HABITAT: Disturbed soil.

RANGE: Native to Europe and Asia; introduced and scattered in the United States.

ILLINOIS DISTRIBUTION: Scattered but rare in Illinois.

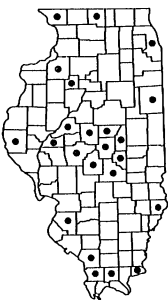
I am following several recent studies that recognize *P. aviculare* as a dimorphic-leaved introduction distinct from the more common *P. arenastrum*, which has uniform leaves. Under this concept, *P. aviculare* is rare in Illinois where it is found along roads and in cultivated fields.

The flowers bloom from June to November.

8. *Polygonum buxiforme* Small, Bull. Torrey Club 33:56. 1906.

Fig. 27.

Annual or perennial (?) from a woody taproot; stem prostrate, tough, ridged, glabrous, to 1 (-5) m long; leaves oblong to oblanceolate, obtuse at the apex, tapering to the base, entire or sometimes crisped, gray-green, to 2 cm long, to 8 mm broad, short-petiolate; ocreae 2-cleft, red-brown with hyaline tips; inflorescence a cluster of 2-6 flowers borne from the axil of each ocrea; flowers short-petiolate; calyx 5-parted, the sepals cucullate, greenish with pink or white borders, 2-3 mm long; petals absent; stamens 8; achene 3-angular, ovoid, acute at the apex, substipitate at the base, light or dark brown, minutely striate and punctate, 2.0-2.8 mm long, mostly included within the perianth.



COMMON NAME: Knotweed.

HABITAT: Disturbed soil.

RANGE: Native in the eastern half of the United States.

ILLINOIS DISTRIBUTION: Scattered and not common throughout the state.

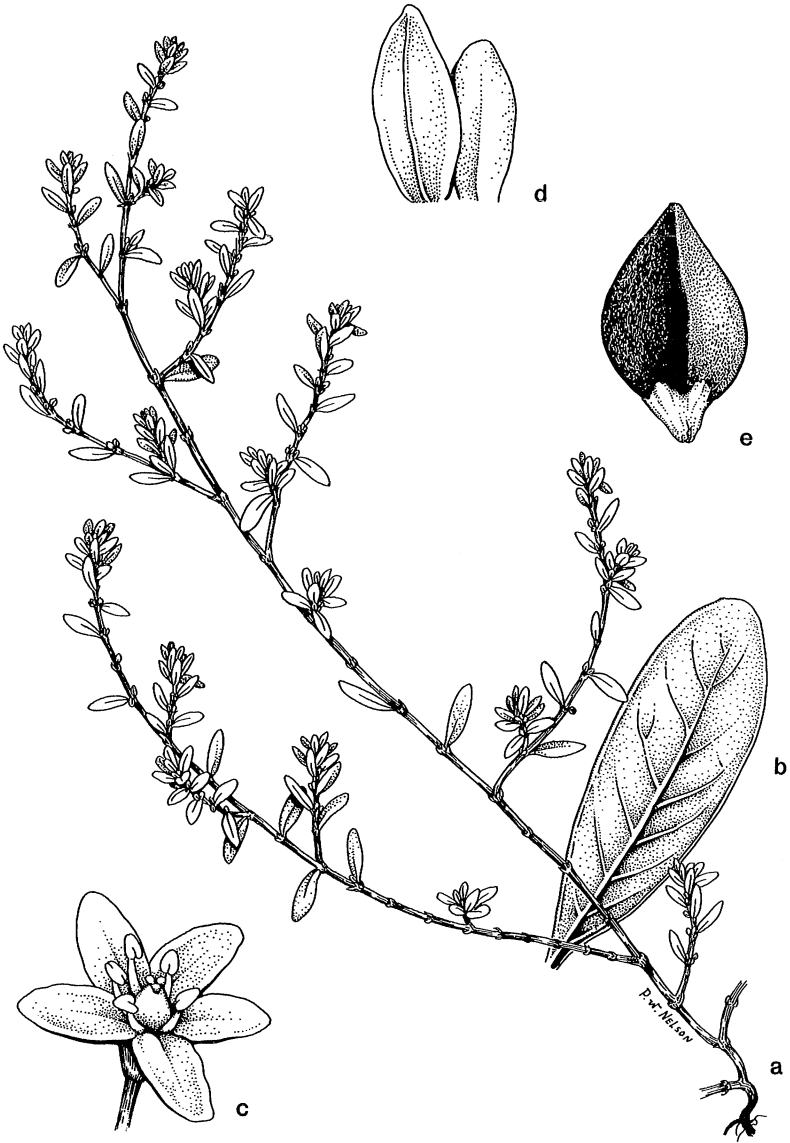
Although this taxon has frequently been lumped with *P. aviculare* (in the traditional sense), the strongly cucullate sepals readily distinguish it from that complex.

The flowers bloom from June through October.

9. *Polygonum prolificum* (Small) Robins. Rhodora 4:68. 1902.

Fig. 28.

Polygonum ramosissimum Michx. var. *prolificum* Small, Bull. Torrey Club 21:171. 1894.



27. *Polygonum buxiforme* (Knotweed). a. Habit, $\times \frac{1}{2}$. b. Leaf, $\times 12$. c. Flower, $\times 25$. d. Sepals, $\times 40$. e. Achene, $\times 25$.



28. *Polygonum prolificum* (Knotweed). a. Habit, $\times 1$. b. Upper part of plant, $\times 5$. c. Leaf, $\times 15$. d. Flower, $\times 25$. e. Sepals, $\times 35$. f. Achene, $\times 25$. g. Ocrea, $\times 15$.

Annual from slender roots; stems ascending to erect, branched, glabrous, to 75 cm tall; leaves linear to lanceolate to oblong, obtuse to acute at the apex, tapering to the base, entire, blue-green, to 3 cm long, to 5 mm broad, sessile or subsessile; ocreae shredded; inflorescence a cluster of 1–3 flowers from the axils of the upper ocreae; flowers short-pedicellate; calyx 5-parted, the sepals green with pink or white borders, about 2 mm long, the outer three somewhat larger than the inner two; petals absent; stamens 5 (–8); achene 3-angular, ovoid, black, shining, smooth, 2–3 mm long, included or exserted from the persistent calyx.



COMMON NAME: Knotweed.

HABITAT: Waste ground.

RANGE: Maine to Virginia; Minnesota to Washington, south to New Mexico, Oklahoma, Arkansas, and Illinois.

ILLINOIS DISTRIBUTION: Known only from a few scattered localities.

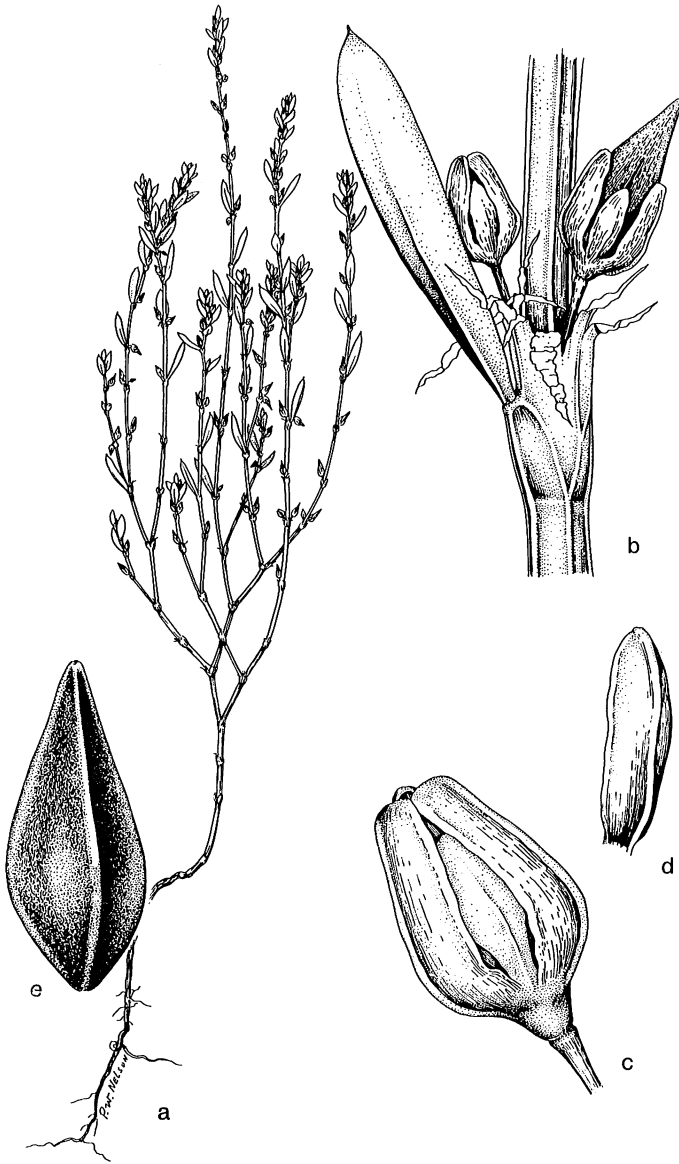
This primarily western species has been found sparingly in Illinois.

Several of the collections reported here were originally reported by Jones et al. (1955) as *P. buxiforme*. The shiny achenes and the blue-green leaves serve to distinguish this species.

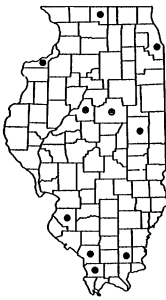
Polygonum prolificum flowers from July to October.

10. *Polygonum exsertum* Small, Bull. Torrey Club 21:172. 1894. Fig. 29.

Annual from slender roots; stems ascending to erect, branched, striate, glabrous, to 1 m tall; leaves lanceolate to oblanceolate, acute and often cuspidate at the apex, tapering to the base, usually pale green or yellow-green, entire, glabrous, to 5 cm long, to 8 mm broad, short-petiolate to nearly sessile; ocreae silvery to brownish, shredded; inflorescence a cluster of 1–4 flowers from the axils of the ocreae; flowers short-pedicellate; calyx 5- (6-) parted, the sepals green with white borders, 3–4 mm long; petals absent; stamens 5 (–6); achene 3-angular, lanceoloid, greenish, shining, smooth, 4–6 mm long, long-exserted beyond the persistent calyx.



29. *Polygonum exsertum* (Long-fruited Knotweed). a. Habit, $\times 1$. b. Node, $\times 12$. c. Flower encasing fruit, $\times 25$. d. Sepal, $\times 20$. e. Achene, $\times 20$.



COMMON NAME: Long-fruited Knotweed.

HABITAT: Sandy banks and shores.

RANGE: New Brunswick to Saskatchewan, south to Nebraska, Illinois, Indiana, and New Jersey.

ILLINOIS DISTRIBUTION: Scattered sparingly throughout the state.

Botanists disagree as to the proper disposition of this plant. I am following Löve and Löve (1956) who give reasons for recognizing *P. exsertum* as a separate species. Gleason (1952), Steyermark (1963), and Swink and Wilhelm (1979) combine this plant with *P. ramosissimum*.

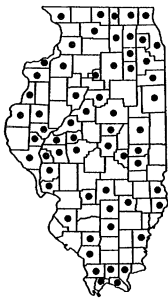
mosissimum.

The elongated, exserted achene is the most striking feature of this species.

Polygonum exsertum flowers from July to October.

11. *Polygonum ramosissimum* Michx. Fl. Bor. Am. 1:237. 1803. Fig. 30.

Annual from slender roots; stems ascending to erect, branched, striate, glabrous, to 1 m tall; leaves linear to lanceolate, acute at the apex, tapering to the base, yellow-green, entire, glabrous, to 5 cm long, to 1 cm broad, short-petiolate; ocreae becoming shredded with age; inflorescence a cluster of 1-3 flowers from the axils of the upper ocreae; flowers short-pedicellate; calyx 5- (6-) parted, yellowish to yellow-green, 2.5-3.5 mm long; petals absent; stamens (5-) 6; achene 3-angular, ovoid, dark brown, shining, smooth, 3-4 mm long, generally included within the persistent calyx.



COMMON NAME: Knotweed.

HABITAT: Sandy soil.

RANGE: Quebec to Washington, south to New Mexico, Texas, Missouri, Illinois, Pennsylvania, and Delaware.

ILLINOIS DISTRIBUTION: Occasional throughout the state.

This is a much branched, bushy species that is found primarily in sandy soils.

There is some variation in fruit size and shape, but all specimens examined had fruits never exceeding 4 mm in length.

This species flowers from July to October.

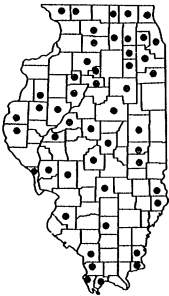


30. *Polygonum ramosissimum* (Knotweed). a. Habit (silhouette), $\times \frac{1}{8}$. b. Habit, $\times 1$. c. Node, $\times 12$. d. Flower, $\times 20$. e. Sepal, $\times 25$. f. Achene, $\times 20$.

12. *Polygonum erectum* L. Sp. Pl. 363. 1753. Fig. 31.

Polygonum aviculare L. var. *erectum* (L.) Meisn. Monogr. 88. 1826.

Annual from slender roots; stems ascending to erect, branched, striate, glabrous, to 1 m tall; leaves elliptic to oval, obtuse to subacute at the apex, tapering to the base, yellow-green, entire, glabrous, strongly dimorphic, the leaves on the main branches 2.5–6.0 cm long, 1–3 cm wide, the leaves on the lateral branches about half as large, subsessile to short-petiolate; ocreae silvery, becoming shredded at maturity; inflorescence a cluster of 1–2 flowers from the axils of the ocreae; flowers short-pedicellate; calyx 5-parted, yellowish to yellow-green, 3.0–3.5 mm long; petals absent; stamens (5–) 6 (–8); achene 3-angular, ovoid, acute, brown, dull, minutely striate and punctate, 3.0–3.5 mm long, included within the persistent calyx, stipitate.



COMMON NAME: Knotweed.

HABITAT: Waste ground and disturbed soil.

RANGE: Quebec to Minnesota, south to Kansas, Missouri, and Georgia.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

Although Gleason (1952) states that the fruits may sometimes be shiny, I have not observed this feature in Illinois material.

This species may not be specifically distinct from *P. achoreum*. It differs from *P. achoreum* by its fruiting pedicels exserted beyond the ocreae, by its calyx with yellowish-green margins, and by its longer achenes.

Polygonum erectum flowers from August to October.

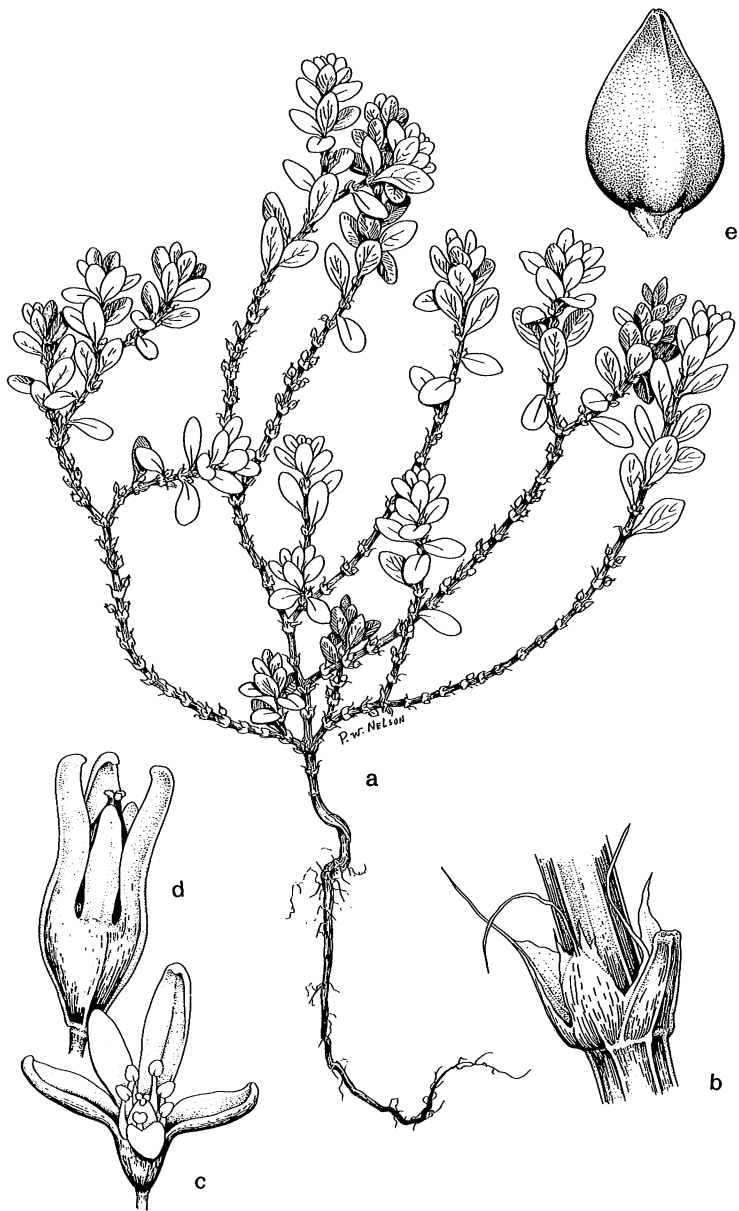
13. *Polygonum achoreum* Blake, Rhodora 19:232. 1917.

Fig. 32.

Annual from a woody taproot; stems ascending to erect, branched, striate, glabrous, to 45 cm tall; leaves elliptic to obovate, obtuse to subacute at the apex, tapering to the base, blue-green, entire, glabrous, to 3 cm long, to 1.5 cm broad, short-petiolate to subsessile; ocreae scarious, tardily becoming shredded at maturity; inflorescence a cluster of 1–3 flowers from the axils of the ocreae; flowers very short-pedicellate; calyx 5-parted, the lobes green to blue-green, 2.5–3.0 mm long; petals absent; stamens 3–8; achene 3-



31. *Polygonum erectum* (Knotweed). a. Habit, $\times 1$. b. Node, $\times 15$. c. Flower, $\times 20$. d. Sepal with one stamen, $\times 30$. e. Achene, $\times 25$.



32. *Polygonum achoreum* (Knotweed). a. Habit, $\times 1$. b. Node, $\times 15$. c. Flower, $\times 20$. d. Flower encasing young fruit, $\times 25$. e. Achene, $\times 25$.

angular, ovoid, acute, olivaceous, dull, minutely punctate, 2.5–3.5 mm long, included within the persistent calyx, except late in the season.



COMMON NAME: Knotweed.

HABITAT: Waste ground.

RANGE: Newfoundland to Alaska, south to Idaho, South Dakota, Missouri, Illinois, and New York.

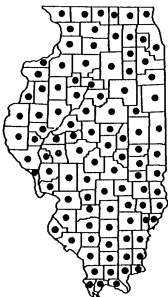
ILLINOIS DISTRIBUTION: Scattered throughout the state.

The usual lack of shredded ocreae distinguishes this species from most other members of section *Polygonum*. It is questionably recognized in this work as distinct from *P. erectum*.

This species flowers from August to October.

14. *Polygonum arenastrum* Bor. Fl. Centr. Fr., ed. 3, 2:560. 1857. Fig. 33.

Annual from a wiry taproot; stems prostrate to ascending to erect, frequently mat-forming, often tough, branched, slightly grooved, glabrous, to 60 cm long; leaves broadly elliptic to oval to oblong, obtuse to acute at the apex, tapering to the base, entire, green to pale green to blue-green, to 3 cm long, to 8 mm broad, sessile or subsessile; ocreae silvery, shredded; inflorescence a cluster of 1–5 flowers borne from the axil of each ocrea; flowers sessile to short-pedicellate; calyx 5-parted, the sepals usually green with pink or white borders, 2–3 mm long; petals absent; stamens 5 or 8; achene 3-angular to somewhat appressed, ovoid, acute to acuminate at the apex, dark brown (often pale late in the season), shiny along the margins, striate to granular to minutely punctate, 1.5–2.5 mm long, included or barely exerted from the persistent calyx.



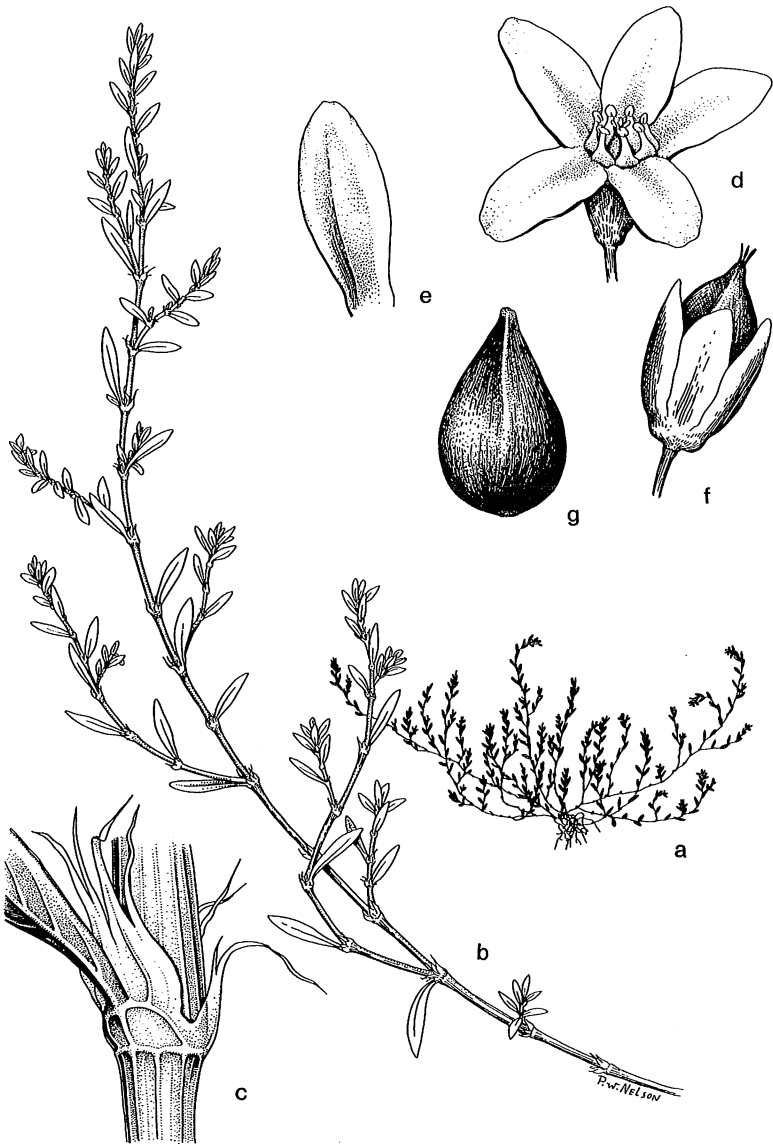
COMMON NAME: Knotweed.

HABITAT: Disturbed soil.

RANGE: This species probably is introduced from Europe and Asia.

ILLINOIS DISTRIBUTION: In every county.

I am following the more recent treatments of section *Polygonum* by recognizing *P. arenastrum* as the correct binomial for the weedy knotweed in Illinois in place of *P. aviculare*. This latter binomial is applied in this work to a different, rare species in Illinois that has strongly dimorphic leaves.



33. *Polygonum arenastrum* (Knotweed). a. Habit (silhouette). $\times \frac{1}{2}$. b. Upper part of plant $\times 2$. c. Ocrea, $\times 15$. d. Flower, $\times 25$. e. Sepal, $\times 30$. f. Developing fruit, $\times 25$. g. Achene, $\times 25$.

There is much variability in flower color, growth form, and leaf size in *P. arenastrum*. Much of the variation seems to be related to time of year and habitat conditions. In September and October, it is not uncommon to see specimens with very pale achenes that are long-exserted beyond the perianth.

The flowers bloom from June to November.

15. *Polygonum neglectum* Besser, Enum. Pl. 45. 1822. Fig. 34.
Polygonum aviculare L. var. *angustissimum* Meisn. in DC.
Prodr. 14:98. 1856.

Annual from a wiry taproot; stems ascending, branched, striate, glabrous, to 30 cm tall; leaves linear to linear-lanceolate, acute to acuminate at the apex, cuneate to the nearly sessile base, green, entire, to 3 cm long, to 3 mm broad; ocreae silvery, shredded; inflorescence a cluster of 2–3 flowers from the axils of the ocreae; flowers short-pedicellate; calyx 5-parted to below the middle, the lobes greenish white to rose; petals absent, stamens (5–) 8; achene 3-angular, ovoid, acute, brown, minutely punctate, 2–3 mm long, usually exserted beyond the persistent calyx.



COMMON NAME: Knotweed.

HABITAT: Disturbed soil.

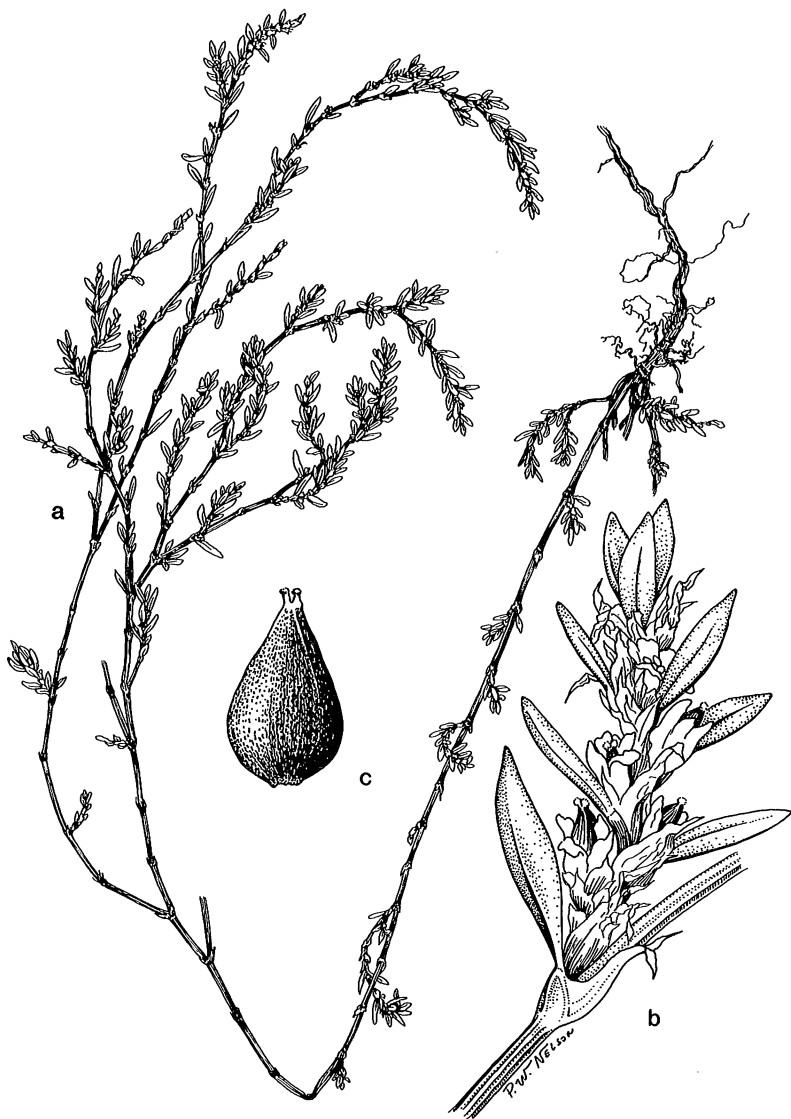
RANGE: Native to Europe; introduced and scattered in the United States.

ILLINOIS DISTRIBUTION: Scattered but not common in Illinois.

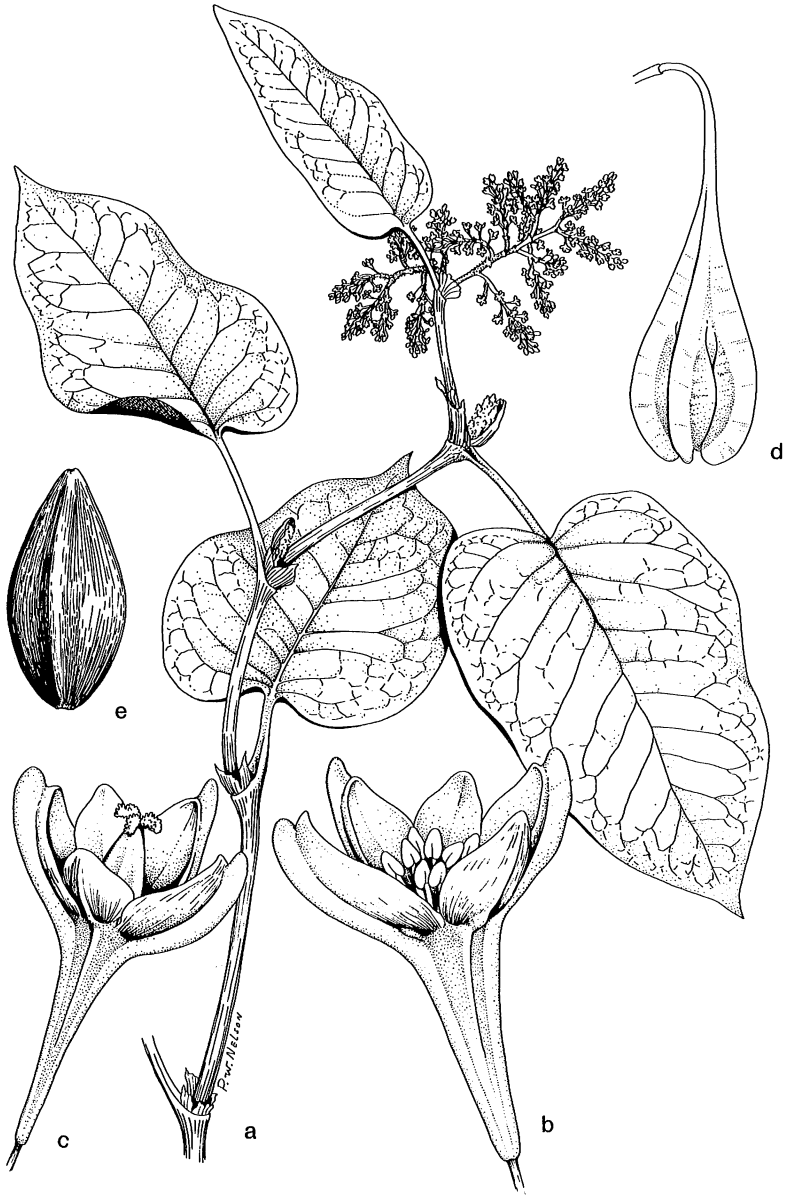
This perplexing species is distinguished by its very narrow leaves, although there tends to be intergradation to *P. aviculare* and *P. arenastrum*. It flowers from June to October.

16. *Polygonum sachalinense* F. Schmidt ex Maxim, Prim. Fl. Amur. 233. 1859. Fig. 35.

Coarse dioecious perennial from stout rhizomes; stems woody below, erect, glabrous, much branched, angular, to 4 m long; leaves ovate to oblong-ovate, tapering to an acute tip, cordate at the base, entire to undulate, glabrous, to 30 cm long, to 15 cm broad, petiole; ocreae oblique, rather quickly falling away; inflorescence a cluster of racemes from the axils of the upper leaves; flowers unisexual, pedicellate; calyx 5-parted, green; petals absent; stamens 8; achenes 3-angular, ellipsoid, smooth, shining, 3–4 mm long, enclosed by the persistent calyx.



34. *Polygonum neglectum* (Knotweed). a. Habit, $\times 2$. b. Inflorescence, $\times 8$. c. Achene, $\times 2$.



35. *Polygonum sachalinense* (Giant Knotweed). a. Upper part of staminate plant, $\times 1$. b. Staminate flower, $\times 30$. c. Pistillate flower, $\times 30$. d. Fruit, $\times 30$. e. Achene, $\times 20$.



COMMON NAME: Giant Knotweed.

HABITAT: Roadside.

RANGE: Native of eastern Asia; rarely adventive in the United States.

ILLINOIS DISTRIBUTION: Known only from Jackson County, near the south edge of Carbondale, and from Logan County, near New Holland.

This robust species is very similar to *P. cuspidatum*, but differs by its angular stems and its cordate leaves.

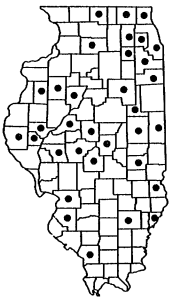
This species is rarely encountered in the United States.

Its Jackson County location is by a stream along a roadside where it has persisted for many years.

The giant knotweed flowers during August and September.

17. *Polygonum cuspidatum* Sieb. & Zucc. Fl. Jap. Fam. Nat. 2:84. 1846. Fig. 36.

Coarse dioecious perennial from stout rhizomes; stems woody below, erect, glabrous, much branched, not angular, to 2.5 m long; leaves ovate to oblong-ovate, tapering to an acute or acuminate tip, truncate at the base, entire to undulate, glabrous or less commonly pubescent, to 15 cm long, to 10 cm broad, petiolate; ocreae oblique, quickly falling away; inflorescence a cluster of racemes from the axils of the upper leaves; flowers unisexual, pedicellate; calyx 5-parted, greenish-white; petals absent; stamens 8; achenes 3-angular, oblongoid, smooth, shining, 3–4 mm long, enclosed by the persistent calyx.



COMMON NAME: Japanese Knotweed.

HABITAT: Disturbed soil.

RANGE: Native of eastern Asia; sometimes planted as an ornamental; occasionally escaped from cultivation in the United States.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

The Japanese knotweed is a rather handsome ornamental that grows vigorously in Illinois. It differs from the very similar *P. sachalinense* by its truncate leaves and nonangular stems.

This species flowers during August and September.



36. *Polygonum cuspidatum* (Japanese Knotweed). a. Upper part of staminate plant, $\times 1$. b. Staminate flower, $\times 30$. c. Pistillate flower, $\times 30$. d. Stem with three ocreae and one fruit, $\times 30$. e. Achene, $\times 15$.

18. *Polygonum virginianum* L. Sp. Pl. 360. 1753. Fig. 37.

Tovara virginiana (L.) Raf. Fl. Tell. 3:12. 1836.

Perennial from a knotty rhizome; stems erect, glabrous to pubescent, branched or unbranched, to 1.2 m tall; leaves ovate to ovate-lanceolate, acuminate at the apex, tapering to rounded at the base, entire but usually ciliate along the margins, strigose on the lower surface, glabrous to puberulent on the upper surface, to 15 cm long, to 10 cm broad; ocreae strigose, fringed with bristles; inflorescence of elongated racemes; flowers remote below, becoming closer together above, on pedicels jointed at the tip; calyx 4-parted, the sepals greenish-white, often purple-tinged, 2.0–2.5 mm long; petals absent; stamens 5; styles 2, exserted; achenes lenticular, ovoid, usually dark brown, smooth, shining, 3.5–4.0 mm long, enclosed by the persistent calyx and crowned by the persistent, hooked styles.



COMMON NAME: Virginia Knotweed.

HABITAT: Mesic woods and wooded floodplains.

RANGE: Quebec to Ontario and Minnesota, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Common to occasional throughout the state.

This species is sometimes placed in the segregate genus *Tovara*. Although I am following a more conservative and traditional view of keeping it in *Polygonum*, there is good argument for a separate genus. That argument includes a 4-parted calyx, 5 stamens, 2 styles, and a lenticular achene.

This species occurs in shaded woods. It is a little more common in the southern half of the state than in the northern.

The Virginia knotweed flowers from July to October.

19. *Polygonum careyi* Olney, Proc. Providence Franklin Soc.

1:29. 1847. Fig. 38.

Persicaria careyi (Olney) Greene, Leaflets 1:24. 1904.

Annual from fibrous roots; stems erect, branched or unbranched, glandular-hairy, to 1.5 m tall; leaves lanceolate, or the uppermost linear, acute at the apex, tapering to the base, rough-hairy, to 25 cm long, to 3 cm broad, somewhat punctate, on short, glandular-hairy petioles or sessile; ocreae hispid, fringed with bristles; inflorescence of several, terminal, pendulous racemes, the racemes to 10 cm long, rather loosely flowered, on glandular-hairy peduncles;



37. *Polygonum virginianum* (Virginia Knotweed). *a.* Upper part of plant, $\times 1$. *b.* Flower, side view, $\times 20$. *c.* Flower, face view, $\times 20$. *d.* Sepal, $\times 30$. *e.* Developing fruit encased by calyx, $\times 10$. *f.* Achene, $\times 15$.



38. *Polygonum careyi* (Carey's Smartweed). a. Habit, $\times 1$. b. Stem with ocreae and leaf, $\times 4$. c. Upper part of plant, with immature inflorescence, $\times 1$. d. Flower, $\times 20$. e. Sepals, $\times 25$. f. Achene, $\times 25$.

flowers pedicellate; calyx 5-parted, usually purple; petals absent; stamens 5 (-8); achenes lenticular, obovoid to ovoid, smooth, shining, 1.8-2.5 mm long, 1.5-2.0 mm broad.



COMMON NAME: Carey's Smartweed.

HABITAT: Sandy soil.

RANGE: Maine to Ontario and Minnesota, south to northern Illinois, northern Indiana, Pennsylvania, and Delaware.

ILLINOIS DISTRIBUTION: Known only from Kankakee County.

Carey's smartweed is readily recognized by its glandular-hairy stems and peduncles.

R. A. Schneider first found this species in Kankakee County east of Hopkins Park in 1937, and G. N. Jones discovered it near St. Anne in 1943. It has been found more recently in Grundy County.

This species flowers from July to September.

20. *Polygonum orientale* L. Sp. Pl. 363. 1753. Fig. 39.

Persicaria orientalis (L.) Spach, Hist. Nat. Veg. 10:535. 1841.

Robust annual from fibrous roots; stems erect, branched, pubescent, to 2.5 m tall; leaves ovate, acuminate at the apex, rounded to cordate at the base, ciliate along the margins, usually pubescent on both surfaces, long-petiolate, to 25 cm long, to 15 cm broad; ocreae villous, fringed with cilia; inflorescence of paniced racemes, the racemes pendulous, to 10 cm long, densely flowered, on pubescent peduncles; flowers pedicellate; calyx 5-parted, the sepals crimson to bright rose, showy; petals absent; stamens usually 7; achenes lenticular, flat, orbicular, shining, faintly reticulate, 2.5-3.5 mm long.



COMMON NAME: Prince's Feather.

HABITAT: Disturbed, often rich, soil.

RANGE: Native of Asia; sometimes planted as a garden ornamental and occasionally escaped in the United States.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

The crimson, pendulous racemes of the prince's feather make it a handsome species when in flower. Because of its annual habit, it seldom persists away from cultivation.

This species flowers from June to October.



39. *Polygonum orientale* (Prince's Feather). *a.* Upper part of plant, $\times 1$. *b.* Ocrea, $\times 4$. *c.* Flower and developing fruit, $\times 20$. *d.* Sepal, $\times 35$. *e.* Achene, $\times 15$.

21. *Polygonum punctatum* Ell. Bot. S. C. & Ga. 1:455. 1817.

Fig. 40.

Polygonum acre HBK. Nov. Gen. 2:179. 1817, non Lam. (1788).

Polygonum acre HBK. α *confertiflorum* Meisn. ex DC. Prodr. 14:108. 1856.

Polygonum acre HBK. var. *leptostachyum* Meisn. ex DC. 14:108. 1856.

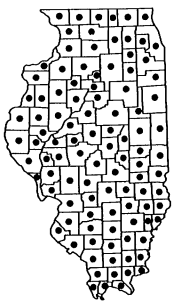
Polygonum punctatum Ell. var. *leptostachyum* (Meisn.) Small, Bull. Torrey Club 19:356. 1892.

Persicaria punctata (Ell.) Small, Fl. SE. U.S. 379. 1903.

Polygonum punctatum Ell. var. *typicum* Fassett, Brittonia 6:371. 1948.

Polygonum punctatum Ell. var. *confertiflorum* (Meisn.) Fassett, Brittonia 6:377. 1948.

Annual or perennial herbs with elongated rootstocks; stems prostrate at the base and rooting at the nodes to ascending, green to purple-red, branched or unbranched, glabrous or nearly so, to 1 m tall; leaves linear-lanceolate to lanceolate to elliptic, acute to acuminate at the apex, tapering to the base, entire, essentially glabrous except for the midrib, usually punctate, to 20 cm long, to 2 cm broad, on short petioles; ocreae glabrous to strigose, fringed with bristles; inflorescence of panicked racemes, the racemes slender; erect to arched, to 15 cm long, interrupted; flowers short, pedicellate; calyx 5-parted, the sepals greenish or greenish-white, punctate, 1.5–2.0 mm long; petals absent; stamens 8; style 2- to 3-parted, achenes lenticular to 3-angular, oblongoid, shiny, smooth, 2.5–3.0 mm long.



COMMON NAME: Smartweed.

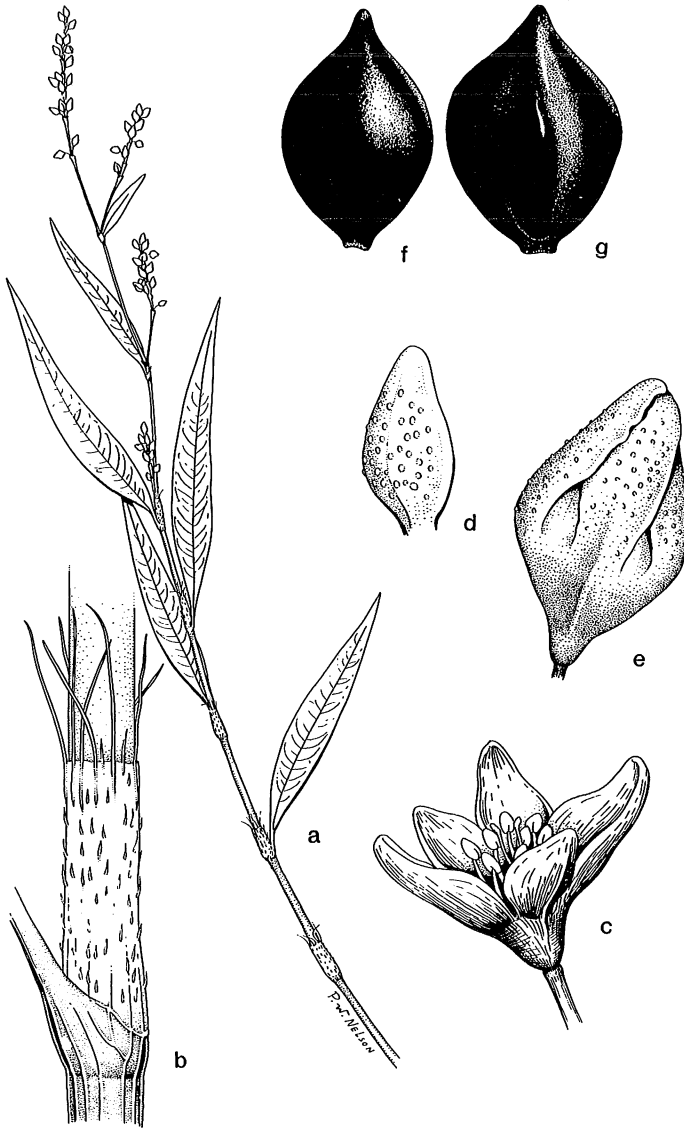
HABITAT: Wet soil of woods and fields.

RANGE: Quebec to British Columbia, south to California, Texas, and Florida; Mexico and Central America; West Indies.

ILLINOIS DISTRIBUTION: Common throughout the state; in every county.

This common and variable species is an inhabitant of wet soil. It occurs in floodplain woods as well as in damp fields and moist, disturbed areas.

Some botanists divide this species into a typical variety and var. *leptostachyum*. The typical variety is said to be a prostrate perennial that roots at the nodes and that has larger, dark green



40. *Polygonum punctatum* (Smartweed). a. Upper part of plant, $\times 1$. b. Ocrea, $\times 10$. c. Flower, $\times 25$. d. Sepal, $\times 25$. e. Sepals enclosing achene, $\times 20$. f. Lenticular achene, $\times 20$. g. Three-angular achene, $\times 20$.

leaves and racemes without remote fascicles of flowers at the base. On the other hand, var. *leptostachyum* is said to be an ascending annual with smaller, pale green leaves and racemes bearing remote flowers all the way to the base.

Except for Mead, Illinois botanists up until 1942 called this species *Polygonum acre* HBK., but this name is illegitimate since Lamarck had used it in 1788 for a totally different species.

Waterfowl and other birds use the achenes of this species in their diet, and deer browse on the herbage.

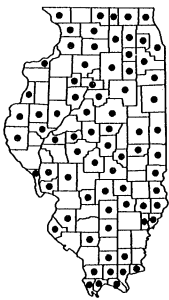
This smartweed flowers from July to November.

22. *Polygonum hydropiper* L. Sp. Pl. 361. 1753. Fig. 41.

Persicaria hydropiper (L.) Opiz, Seznam 72. 1852.

Polygonum hydropiper L. var. *projectum* Stanford, Rhodora 29:87. 1927.

Annual from fibrous roots; stems prostrate to erect, often purple-red, branched or unbranched, glabrous or nearly so, to 55 cm tall; leaves linear-lanceolate to ovate-lanceolate, acute to acuminate at the apex, tapering to somewhat rounded at the base, entire to undulate along the margins, glabrous or sometimes pubescent on the veins, usually punctate, to 8 cm long, to 2.5 cm broad, short-petiolate; ocreae glabrous to pubescent, fringed with short bristles; inflorescence of paniced racemes, the racemes pendulous or arching, to 7 cm long, usually interrupted; flowers short-pedicellate; calyx 4-parted, the sepals greenish, often tinged with purple and bordered with white, punctate, 1.5–2.5 mm long, becoming slightly larger during fruiting; petals absent; stamens 4 (–6); style 2- to 3-parted; achenes lenticular to 3-angled, ovoid, dull, striate, dark brown, 2.0–3.5 mm long.



COMMON NAME: Water Pepper; Smartweed.

HABITAT: Wet ground.

RANGE: Supposedly native to Europe, Asia, and North America. It occurs throughout the United States, where some of the populations are undoubtedly adventive. American plants have sometimes been called var. *projectum* to distinguish them from Old World plants.

ILLINOIS DISTRIBUTION: Occasional throughout the state.

The common name water pepper is derived from the acid taste of the leaves and stems.



41. *Polygonum hydropiper* (Water Pepper; Smartweed). a. Upper part of plant, $\times 1$. b. Ocrea, $\times 8$. c. Inflorescence, $\times 4$. d. Achenes enclosed by calyx, $\times 25$. e. Sepal, $\times 35$. f. Achene, $\times 25$.

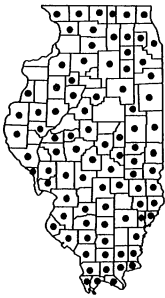
There is considerable variation in sepal color, stamen number, and achene shape and size.

This species flowers from May to November.

23. *Polygonum persicaria* L. Sp. Pl. 361. 1753. Fig. 42.

Persicaria persicaria (L.) Small, Fl. SE. U.S. 378. 1903.

Annual from fibrous roots; stems ascending to erect, branched or unbranched, glabrous or sparingly pubescent, to 75 cm tall; leaves lanceolate to linear-lanceolate, acute at the apex, tapering to the base, entire and often ciliate along the margins, usually with a dark red blotch on the upper surface, glabrous or puberulent, punctate, to 15 cm long, to 3 cm broad, short-petiolate to sessile; ocreae glabrous or more uncommonly strigose, fringed with short bristles; inflorescence of solitary or paniced racemes, the racemes to 4.5 cm long, to 1 cm thick, densely flowered, usually on glabrous peduncles, with a few cleistogamous flowers usually hidden within some of the ocreae; flowers short-pedicellate; calyx 5-parted, the sepals pink to deep red, sometimes greenish, 2–3 mm long, slightly enlarging during fruiting; petals absent; stamens usually 6; style 2- to 3-parted; achenes lenticular, ovoid, shining, smooth, black, 1.5–3.0 mm long.



COMMON NAME: Lady's Thumb.

HABITAT: Disturbed soil and waste ground.

RANGE: Native of Europe; adventive throughout the United States and Canada.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

The lady's thumb is characterized by its short, thickened racemes and the dark red blotch on the upper surface of the leaves.

In addition to the obvious flowers that comprise the racemes, there are cleistogamous flowers hidden in and enclosed by some of the ocreae.

The flowers of this species range from pink to deep red, and may be greenish or greenish-tinged.

Lady's thumb flowers from May to November.

24. *Polygonum cespitosum* Blume var. *longisetum* (DeBruyn)

Steward, Contr. Gray Herb. 88:67. 1930. Fig. 43.

Polygonum longisetum DeBruyn in Miq. Pl. Jungh. 307. 1854.

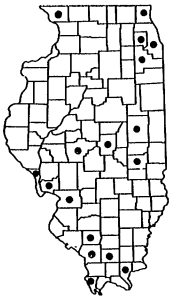


42. *Polygonum persicaria* (Lady's Thumb). a. Habit (silhouette), $\times \frac{1}{6}$. b. Habit, $\times 1$. c. Stem with leaf, $\times 3$. d. Flower, $\times 20$. e. Fruit encased by sepals, $\times 25$. f. Achene, $\times 30$.



43. *Polygonum cespitosum* var. *longisetum* (Creeping Smartweed). a. Ascending plant, $\times 2$. b. Trailing plant, $\times 1$. c. Young plant, $\times 1$. d. Flower, $\times 25$. e. Sepals, $\times 25$. f. Achene, $\times 20$. g. Inflorescence, $\times 10$.

Annual from fibrous roots; stems prostrate to tardily ascending, much branched, glabrous or rarely puberulent, to 75 cm long; leaves lanceolate to elliptic to ovate, acute to acuminate at the apex, tapering to the sessile base, glabrous above, puberulent on the veins below, entire and ciliate along the margins, to 10 cm long, to 3 cm broad; ocreae strigose, fringed with long bristles; inflorescence solitary or a panicle of racemes, the racemes densely flowered, to 4 cm long, to 5 mm thick, on glabrous peduncles; flowers pedicellate; calyx 5-parted, the sepals rose, 2.0–2.5 mm long; petals absent; stamens usually 8; style 2- to 3-parted; achenes 3-angular, shining, smooth, black, 2.0–2.5 mm long.



COMMON NAME: Creeping Smartweed.

HABITAT: Disturbed soil, frequently in lawns and in cracks of sidewalks.

RANGE: Native of southeastern Asia; adventive in the northeastern United States.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

This species has short but showy racemes. It generally creeps along the ground. It grows primarily in shaded lawns and in the cracks of sidewalks. It appears to be on the increase in Illinois.

Typical *P. cespitosum* of Asia has shorter ocreal bristles.

The ocreolae that subtend the flowers in var. *longisetum* are particularly long bristly.

The first Illinois collection was made in 1944.

Creeping smartweed flowers from June to November.

25. *Polygonum setaceum* Baldw. var. *interjectum* Fern. Rhodora 40:414. 1938. Fig. 44.

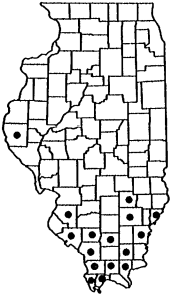
Polygonum hydropiperoides Michx. var. *setaceum* (Baldw.) Gl. Phytologia 4:23. 1952.

Perennial herb from rhizomes; stems erect, branched or unbranched, appressed-pubescent, to 1 m tall; leaves lanceolate to oblanceolate, acute to acuminate at the apex, tapering to the sessile base, strigose to glabrous above and below, entire and sometimes ciliate along the margins, to 15 cm long, to 3.5 cm broad; ocreae sparsely strigose, fringed with bristles; inflorescence solitary or a panicle of racemes, the racemes loosely flowered, to 8 cm long, very narrow, erect, on nearly glabrous peduncles; flowers pedicel-



44. *Polygonum setaceum* var. *interjectum* (Smartweed). a. Habit, $\times 1$. b. Upper part of plant, $\times 1$. c. Inflorescence, $\times 3$. d. Flower, $\times 15$. e. Sepal, $\times 25$. f. Achene, $\times 30$.

late; calyx 5-parted, the sepals mostly white, 2–3 mm long; petals absent; stamens usually 8; style 3-parted; achenes 3-angular, oblongoid, shining, reticulate, black, 2–3 mm long.



COMMON NAME: Smartweed.

HABITAT: Wet ground.

RANGE: Massachusetts to Michigan, south to Missouri, Illinois, and Virginia.

ILLINOIS DISTRIBUTION: Confined to the southern one-third of the state; also Adams County.

The complex of taxa that includes *P. setaceum*, *P. hydro-piperoides*, and *P. opelousanum* is poorly understood. Some botanists consider *P. setaceum* and *P. opelou-sanum* to be varieties of *P. hydropiperoides* since there is some intergradation among the three.

Until more conclusive evidence is available, I prefer to treat these three as distinct species. Under this arrangement, our *P. se-taceum* should be further distinguished as var. *interjectum*, a variety differing from typical var. *setaceum* by shorter leaf pubescence and sparser pubescence of the ocreae.

Polygonum setaceum var. *interjectum* can generally be distin-guished from *P. hydropiperoides* and *P. opelousanum* by its strigose leaves and its white flowers.

This taxon flowers from July to October.

26. *Polygonum hydropiperoides* Michx. Fl. Bor. Am. 1:239. 1803. Fig. 45.

Polygonom barbatum Walt. Fl. Carol. 131. 1788, non L. (1753).

Polygonum persooni Engelm. ex Mead, Prairie Farmer 6:119. 1848, *nomen nudum*.

Persicaria hydropiperoides (Michx.) Small, Fl. SE. U.S. 378. 1903.

Perennial herb from rhizomes; stems decumbent and rooting at the nodes to erect, branched or unbranched, glabrous or sparingly pu-bescent, to 1 m tall; leaves linear-lanceolate to oblong-lanceolate, acute at the apex, tapering to the sessile base, entire and usually ciliate along the margins, to 12 cm long, to 2.5 cm broad; ocreae strigose, fringed with bristles; inflorescence a panicle of racemes, the racemes loosely flowered, to 8 cm long, very narrow, erect, on



45. *Polygonum hydropiperoides* (Mild Water Pepper; Smartweed). a. Upper part of plant, $\times 1$. b. Ocrea, $\times 5$. c. Inflorescence, $\times 3$. d. Ocrea with three developing fruits, $\times 8$. e. Sepals, $\times 20$. f. Achenes, $\times 20$.

nearly glabrous peduncles; flowers pedicellate; calyx 5-parted, the sepals usually pink to rose to purple, rarely greenish, 2.0–3.5 mm long; petals absent; stamens usually 8; style 3-parted; achenes 3-angular, ovoid, shining, smooth, black, 2–3 mm long.



COMMON NAME: Mild Water Pepper; Smartweed.

HABITAT: Wet ground.

RANGE: New Brunswick to Minnesota, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Occasional to common throughout the state.

This species occurs in a variety of wet habitats, from bogs to marshes to shallow standing water.

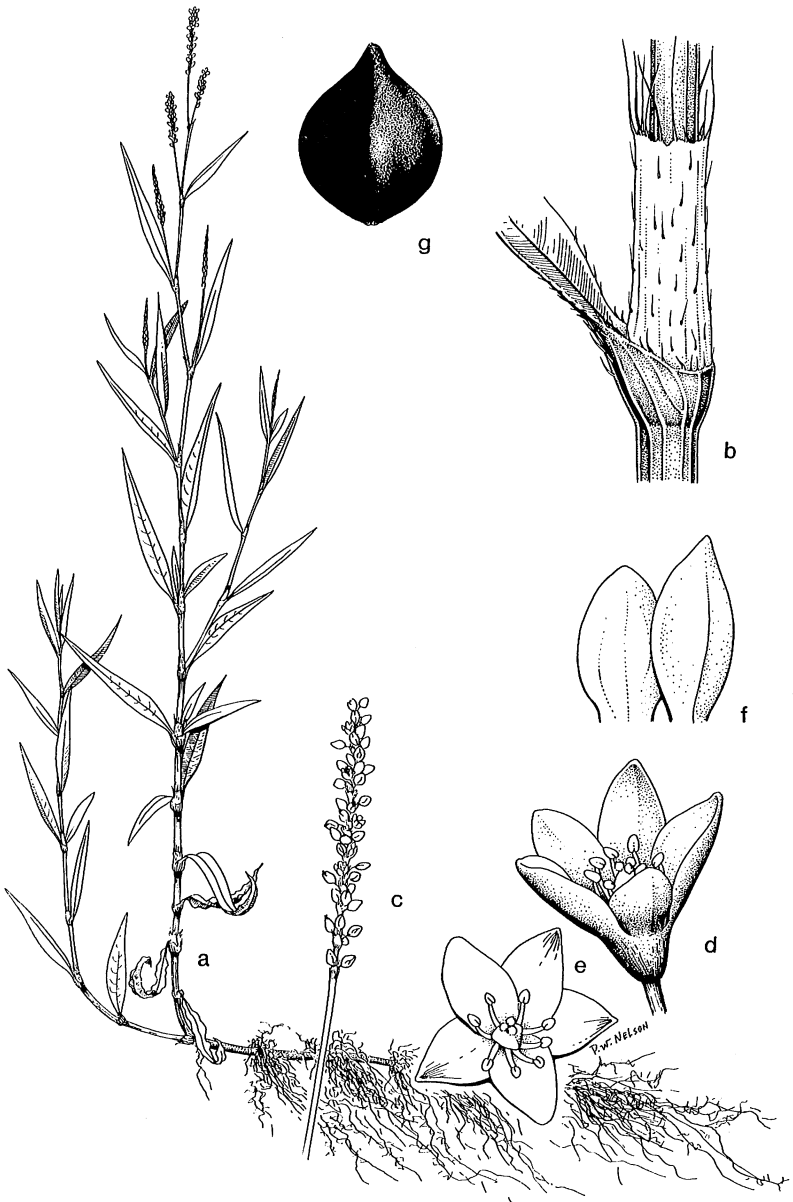
This species differs from *P. setaceum* by its pink to rose to purple sepals and its glabrous or nearly glabrous leaves. It differs from *P. opelousanum* by its pink to rose to purple calyx and its achenes which are completely included within the persistent calyx.

The mild water pepper flowers from June to November.

27. *Polygonum opelousanum* Riddell ex Small, Bull. Torrey Club 19:354. 1892. Fig. 46.

Persicaria opelousana (Riddell) Small, Fl. SE. U.S. 378. 1903.

Perennial herb from rhizomes; stems decumbent and rooting at the nodes to erect, branched or unbranched, glabrous or nearly so, to 1 m tall; leaves linear-lanceolate to lanceolate, acute to acuminate at the apex, tapering to the subsessile or sessile base, entire and usually ciliate along the margins, to 12 cm long, to 2 cm broad; ocreae strigose, fringed with bristles; inflorescence a panicle of racemes, the racemes erect, to 6 cm long, loosely flowered; flowers pedicellate; calyx 5-parted, the sepals greenish-white to greenish-purple, scaly, 2.0–2.5 mm long; petals absent; stamens usually 8; style 3-parted; achenes 3-angular, ovoid to obovoid, shining, smooth, black, 1.5–2.5 mm long, partly exerted from the persistent calyx.



46. *Polygonum opelousanum* (Water Pepper). *a.* Habit, $\times 1$. *b.* Ocrea, $\times 7$. *c.* Inflorescence, $\times 5$. *d.* Flower, side view, $\times 25$. *e.* Flower, face view, $\times 20$. *f.* Sepals, $\times 25$. *g.* Achene, $\times 25$.



COMMON NAME: Water Pepper.

HABITAT: Wet ground.

RANGE: Mississippi and New York to Tennessee, Illinois, Missouri, and Oklahoma, south to Texas and Florida; Mexico.

ILLINOIS DISTRIBUTION: Restricted to the southern one-third of the state; also Will County.

This species of wet ground is distinguished by its nearly glabrous leaves, greenish sepals, and partly exserted achenes.

This species flowers from July to October.

28. *Polygonum amphibium* L. Sp. Pl. 361. 1753. Figs. 47, 48, 49.

Polygonum amphibium L. var. *emersum* Michx. Fl. Bor. Am. 1:240. 1803.

Polygonum amphibium L. var. *natans* Michx. Fl. Bor. Am. 1:240. 1803.

Polygonum coccineum Muhl. ex Willd. Enum. Pl. 1:428. 1809.

Polygonum coccineum Muhl. var. *terrestre* Willd. Enum. Pl. 1:428. 1809.

Polygonum natans (Michx.) Eaton, Man. Bot., ed. 3, 400. 1822.

Polygonum amphibium L. var. *aquaticum* Torr. Fl. N. & Mid. U.S. 1:404. 1824.

Polygonum fluitans Eaton, Man. Bot., ed. 6, 274. 1833.

Polygonum amphibium L. var. *muhlenbergii* Meisn. ex DC. Prodr. 14:116. 1856.

Polygonum hartwrightii Gray, Proc. Am. Acad. 8:294. 1870.

Polygonum amphibium L. var. *stipulaceum* Coleman, Cat. Fl. Pl. S. Penins. Mich. 32. 1874.

Polygonum muhlenbergii (Meisn.) S. Wats. Proc. Am. Acad. 14:295. 1879.

Polygonum emersum (Michx.) Britt. Trans. N. Y. Acad. Sci. 8:73. 1889.

Polygonum amphibium L. var. *hartwrightii* (Gray) Bissell, Rhodora 4:104. 1902.

Persicaria fluitans (Eaton) Greene, Leaflets 1:26. 1904.

Persicaria praticola Greene, Leaflets 1:36. 1904.

Persicaria spectabilis Greene, Leaflets 1:37. 1904.

Persicaria muhlenbergii (Meisn.) Small ex Rydb. Fl. Colo. III. 1906.

Polygonum amphibium L. var. *marginatum* f. *hirtuosum* Farw. Papers Mich. Acad. Sci. 1:93. 1923.

Polygonum natans (Michx.) Eaton f. *hartwrightii* (Gray) Stanford, Rhodora 27:160. 1925.

Polygonum coccineum Muhl. f. *terrestre* (Willd.) Stanford, Rhodora 27:162. 1925.

Polygonum coccineum Muhl. var. *pratincta* (Greene) Stanford, Rhodora 27:162. 1925.

Polygonum coccineum Muhl. f. *natans* (Wieg.) Stanford, Rhodora 27:165. 1925.

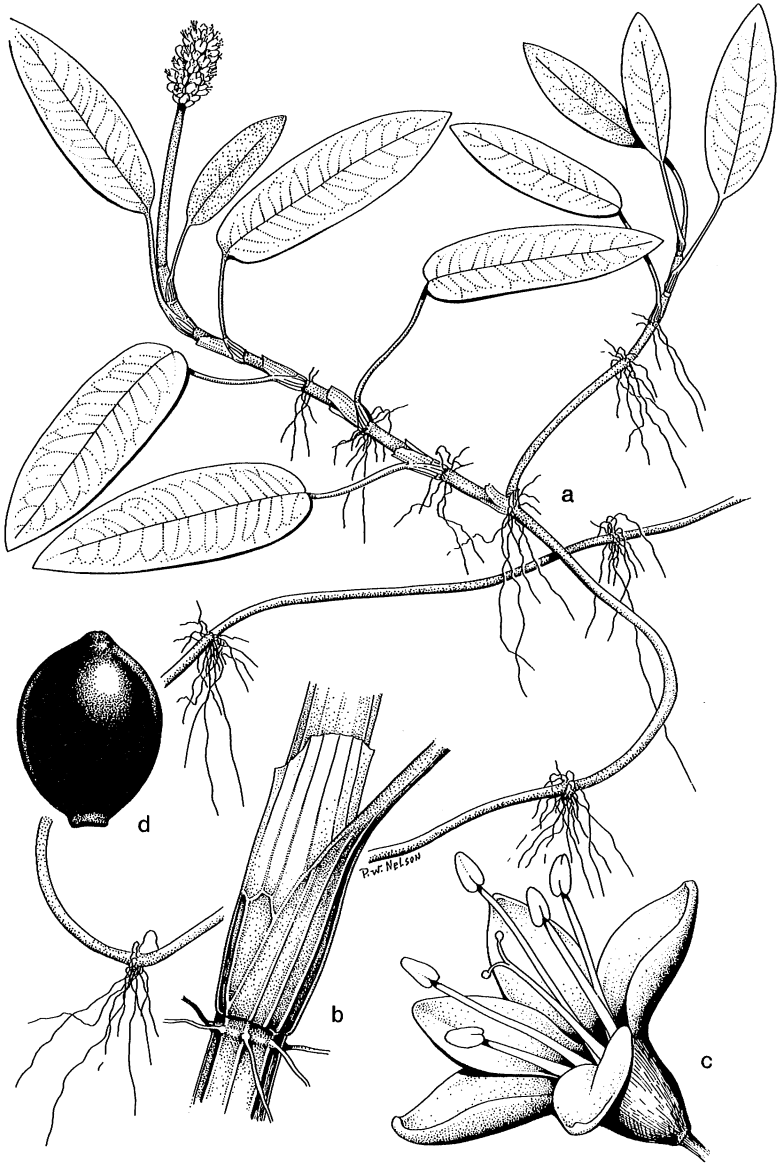
Polygonum amphibium L. var. *stipulaceum* Coleman f. *hirtuosum* (Farw.) Fern. Rhodora 8:49. 1946.

Polygonum fluitans Eaton f. *hartwrightii* (Gray) G. N. Jones, Fl. Ill. 124. 1950.

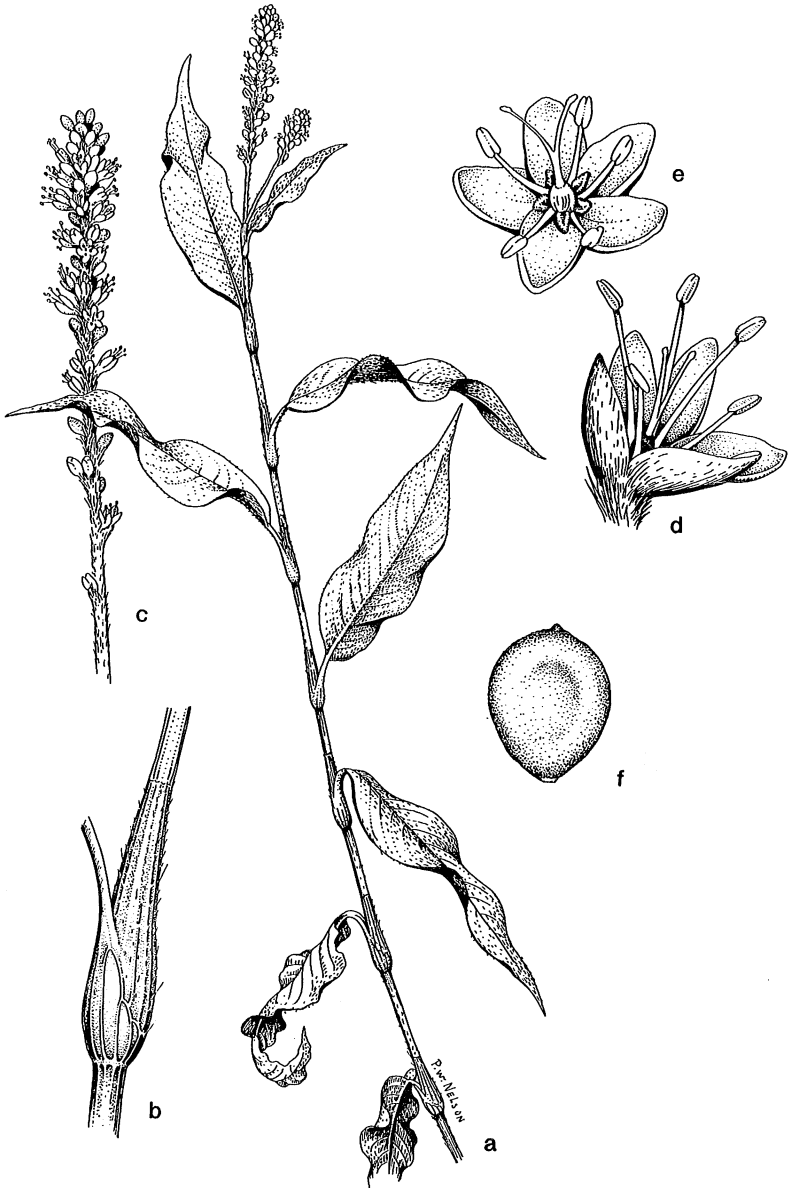
Aquatic or terrestrial perennial herb from rhizomes or stolons; stems floating or trailing or erect, glabrous or pubescent, branched or unbranched, to 10 m long; leaves elliptic to nearly oval to ovate-lanceolate, obtuse to acute to acuminate at the apex, rounded or tapering to the base, rarely cordate, entire or undulate and sometimes ciliate along the margins, glabrous or pubescent on both surfaces, to 20 cm long, to 8 cm broad, usually short-petiolate; ocreae glabrous to puberulent, fringed with short bristles or bristles absent, sometimes flanged at the summit; inflorescence composed of 1-3 -several racemes, the racemes erect, densely flowered, to 18 cm long, to 1.5 cm thick, on stout, glabrous or pubescent peduncles; flowers pedicellate; calyx 5-parted, the sepals rose to pink, 3-5 mm long; petals absent; stamens 5, some included, some exserted; style 2-cleft; achenes lenticular, obovoid to oblongoid, shining, smooth or somewhat granular, dark brown to black, 2.5-3.0 mm long.



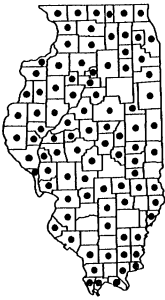
47. *Polygonum amphibium* (Water Smartweed; Scarlet Smartweed). *a.* Upper part of plant, with inflorescence, $\times 1$. *b.* Stem with ocrea, $\times 3$. *c.* Flower, $\times 10$. *d.* Achene, $\times 60$. Hairy form. *e.* Habit, $\times 1$. *f.* Ocrea, $\times 3$.



48. *Polygonum amphibium* (Water Smartweed; Scarlet Smartweed—aquatic form).
a. Habit, $\times 1$. b. Ocrea, $\times 6$. c. Flower, $\times 20$. d. Achene, $\times 20$.



49. *Polygonum amphibium* (Water Smartweed; Scarlet Smartweed—additional forms). *a.* Upper part of plant, $\times 1$. *b.* Ocrea, $\times 5$. *c.* Inflorescence, $\times 3$. *d.* Flower, side view, $\times 15$. *e.* Flower, face view, $\times 15$. *f.* Achene, $\times 15$.



COMMON NAMES: Water Smartweed; Scarlet Smartweed.

HABITAT: Standing water; wet ground.

RANGE: Throughout the United States; Mexico.

ILLINOIS DISTRIBUTION: Scattered throughout the state.

The list of synonymy indicates the extreme variability of this species. It sometimes is found in deep water, in shallow water, or merely in moist soil. The ocreae may or may not have bristles. Pubescence of the stems and leaves is extremely variable or even lacking. It does not seem wise, or even feasible, to assign subspecific names to these variants.

This smartweed flowers from June to September.

29. *Polygonum bicorne* Raf. Fl. Ludov. 29. 1817. Fig. 50.

Polygonum longistylum Small, Bull. Torrey Club 21:169. 1894.

Persicaria longistyla (Small) Small, Fl. SE. U.S. 337. 1903.

Annual from slender roots; stems erect, branched or unbranched, glabrous below, glandular-pubescent above, to 1 m tall; leaves lanceolate to ovate-lanceolate, acute to acuminate at the apex, rounded or tapering to the base, entire and often ciliate along the margins, glabrous or nearly so on both surfaces, punctate below, petiolate; ocreae glabrous, without bristles or with very short bristles; inflorescence a panicle of racemes, the racemes pendulous, to 8 cm long, to 1 cm thick, on glandular-pubescent peduncles; flowers pedicellate; calyx 5-parted, the sepals pink, 2.0–3.5 mm long; petals absent; stamens 6–8; style 2-parted, exceeding the stamens in some flowers, shorter than the stamens in others; achenes lenticular, ovoid, black, shining, granular, 2.5–3.0 mm long.



COMMON NAME: Smartweed.

HABITAT: Wet ground.

RANGE: Southern Illinois to Kansas, south to New Mexico and Louisiana.

ILLINOIS DISTRIBUTION: Known only from Alexander, Gallatin, Kendall, Macon, Randolph, St. Clair, and Union counties.

Although this species has been called *P. longistylum* for years, Rafinesque's *P. bicorne* predates it.

This species is unique in that either the stamens or the styles of a particular flower are long-exserted, a condition known as heterostyly.



50. *Polygonum bicorne* (Smartweed). a. Upper part of plant, $\times 1$. b. Ocrea and leaf, $\times 4$. c. Flower with long styles, $\times 20$. d. Flower with short styles, $\times 20$. e. Sepal, $\times 25$. f. Achene, $\times 25$.

Until the last two decades, this species was known in Illinois only from a single collection made by H. Eggert from St. Clair County late in the nineteenth century.

Polygonum bicornes flowers from July to October.

30. *Polygonum scabrum* Moench, Meth. Pl. 629. 1794. Fig. 51.

Annual from slender roots; stems erect, branched or unbranched, glabrous below, glandular above, to 1 m tall; leaves lanceolate to oblong-lanceolate, acute to acuminate at the apex, tapering to the base, entire along the margins, white-tomentose to nearly glabrous, to 25 cm long, to 10 cm broad, petiolate; ocreae pubescent, without bristles; inflorescence a panicle of racemes, the racemes erect, densely flowered, to 5 cm long, to 1.5 cm thick, on short, glandular peduncles; flowers short-pedicellate; calyx 5-parted, the sepals pink to greenish-white, 3.0–4.5 mm long; petals absent; stamens usually 6; style 2-parted; achenes lenticular, ovoid, dark brown to black, shining, smooth, 2.5–3.5 mm long.



COMMON NAME: Smartweed.

HABITAT: Along railroads.

RANGE: Native of Europe; occasionally adventive in Canada and the northern United States.

ILLINOIS DISTRIBUTION: Known only from Champaign and Lee counties.

This adventive has been found twice in Illinois along railroads. It is similar to *P. lapathifolium*, but is hairier and generally has larger leaves and flowers.

This plant has been called *P. tomentosum*, which is a different species.

Polygonum scabrum flowers from June to August.

31. *Polygonum lapathifolium* L. Sp. Pl. 360. 1753. Fig. 52.

Polygonum incarnatum Ell. Bot. S.C. & Ga. 1:456. 1817.

Persicaria lapathifolia (L.) S.F. Gray, Nat. Arr. Brit. Pl. 2:270. 1821.

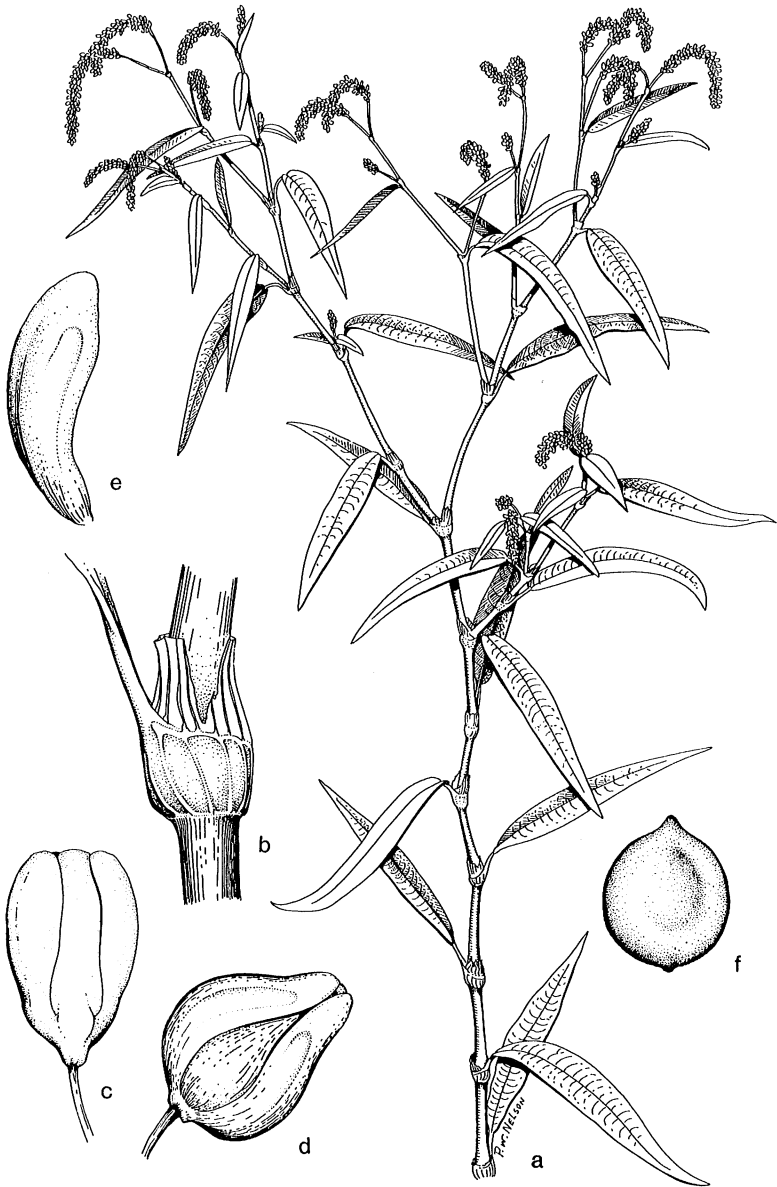
Polygonum lapathifolium L. var. *incarnatum* (Ell.) Wats. in Gray, Man. Bot., ed. 6, 440. 1890.

Polygonum lapathifolium L. var. *nodosum* Small, Mem. Torrey Club 5:140. 1894.

Annual from slender roots; stems ascending to erect, branched or unbranched, glabrous except sometimes for the presence of sessile glands, to 1.5 m tall; leaves lanceolate, acute to acuminate at the



51. *Polygonum scabrum* (Smartweed). a. Habit, $\times 1$. b. Ocrea, $\times 15$. c. Inflorescence, $\times 3$. d. Flower, $\times 15$. e. Sepals, $\times 20$. f. Achene, $\times 20$.



52. *Polygonum lapathifolium* (Pale Smartweed). *a.* Upper part of plant, $\times 1$. *b.* Ocrea, $\times 8$. *c.* *d.* Flowers enclosing the achenes, $\times 20$. *e.* Sepal, $\times 25$. *f.* Achene, $\times 20$.

apex, tapering to the base, entire and ciliate along the margins, usually glabrous, sometimes with sessile glands on the lower surface, inconspicuously punctate, to 25 cm long, to 5 cm broad, short-petiolate; ocreae usually glabrous, without bristles; inflorescence a panicle of racemes, the racemes pendulous, densely flowered, to 6.5 cm long, to 8 mm thick, the peduncles glabrous but occasionally with sessile glands; flowers short-pedicellate; calyx 5-parted, the sepals pink, often with a greenish tinge, 2.0–3.5 mm long; petals absent; stamens usually 6; style 2-parted; achenes lenticular, oblong-oid to ovoid, dark brown to black, shining, reticulate, 1.7–2.3 mm long.



COMMON NAME: Pale Smartweed.

HABITAT: Disturbed soil.

RANGE: Throughout North America, Europe, and Asia.

ILLINOIS DISTRIBUTION: Common throughout the state.

This very common species of moist, disturbed soil is highly variable. Many of the variations have received varietal or form epithets, but none seems worthy of recognition because of the great inconstancy of characters.

Some of the early Illinois botanists chose to use the binomial *P. incarnatum* for this species, but *P. incarnatum*

is clearly the same as the earlier *P. lapathifolium*.

The achenes are an excellent food source for wildlife.

The flowers bloom from June to November.

32. *Polygonum pensylvanicum* L. Sp. Pl. 362. 1753.

Persicaria pensylvanica (L.) Small, Fl. SE. U.S. 377. 1903.

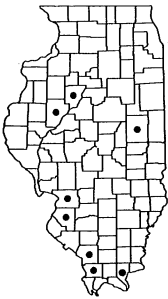
Annual from slender roots; stems erect, branched or unbranched, glabrous or pubescent, sometimes glandular, to 2 m tall; leaves lanceolate to oval-lanceolate, acute to acuminate at the apex, tapering to the base, entire and ciliate along the margins, glabrous to strigose, sometimes glandular, to 25 cm long, to 8 cm broad, short-petiolate; ocreae glabrous, without bristles; inflorescence a panicle of racemes, the racemes erect, to 5 cm long, to 1.5 cm thick, densely flowered, on glabrous to pubescent to glandular-stipitate peduncles; flowers short-pedicellate; calyx 5-parted, the sepals pink to white, 2.0–3.5 mm long; petals absent; stamens (6–) 8; style 2-parted; achenes lenticular, dark brown to black, ovoid to orbicular, dull to sublustrous, smooth, 2.5–3.5 mm long.

Three somewhat intergrading varieties are recognized in this work:

- 1. Leaves strigose ----- 2
- 1. Leaves glabrous ----- 32b. *P. pensylvanicum* var. *laevigatum*
- 2. Peduncles with spreading, gland-tipped hairs -----
----- 32a. *P. pensylvanicum* var. *pensylvanicum*
- 2. Peduncles hispid, with few or no gland-tipped hairs -----
----- 32c. *P. pensylvanicum* var. *durum*

32a. *Polygonum pensylvanicum* L. var. *pensylvanicum* Fig. 53a.

Leaves strigose; peduncles with spreading, gland-tipped hairs; stamens usually 8.



COMMON NAME: Common Smartweed.

HABITAT: Wet ground.

RANGE: Nova Scotia to Ontario and Minnesota, south to Texas and Florida.

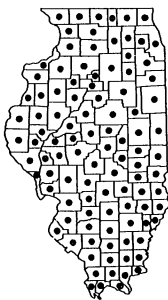
ILLINOIS DISTRIBUTION: Occasional throughout the state.

Most specimens of this variety have leaves that are clearly strigose. The spreading, gland-tipped hairs on the peduncles serve to distinguish this variety from var. *durum*, but not from var. *laevigatum*.

This variety flowers from May to October.

32b. *Polygonum pensylvanicum* L. var. *laevigatum* Fern. Rhodora 19:78. 1917. Fig. 53b-e.

Leaves glabrous.



COMMON NAME: Common Smartweed.

HABITAT: Wet ground.

RANGE: Nova Scotia to Ontario and Minnesota, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Common throughout the state; in every county.

This smooth variety of *P. pensylvanicum* is the most common variety of this species in Illinois.

Considerable intergradation of pubescence occurs between var. *laevigatum* and var. *pensylvanicum*.

This variety flowers from May to October.



53. *Polygonum pensylvanicum* (Common Smartweed). a. Upper part of plant, $\times 1$. var. *laevigatum*. b. Ocrea, $\times 5$. c. Flowers, $\times 20$. d. Sepal, $\times 25$. e. Achene, $\times 15$. var. *durum* (Smartweed). f. Inflorescence, $\times 5$.

32c. Polygonum pensylvanicum L. var. durum Stanford, *Rhodor* 27:178. 1925. *Fig. 53f*.

Leaves strigose; peduncles hispid, with few or no gland-tipped hairs; stamens usually 6.



COMMON NAME: Smartweed.

HABITAT: Wet ground.

RANGE: Virginia to Florida and Texas, north to southern Illinois.

ILLINOIS DISTRIBUTION: Rare in Illinois.

This is a rare Coastal Plain variety that differs by its glandless hispidity on the peduncles. It flowers during the summer.

Order Hamamelidales

The Hamamelidales in Illinois consist of two families, the Hamamelidaceae and the Platanaceae. Most members of the order have highly reduced flowers, with many of them having the reduced flowers borne in unisexual spikes, known as catkins, or aments. The Hamamelidaceae are more primitive than the Platanaceae because some of them have perfect flowers with well-developed petals.

HAMAMELIDACEAE—WITCH HAZEL FAMILY

Trees or shrubs; leaves alternate, simple, stipulate; flowers perfect or unisexual, borne in heads or spikes; calyx 4-parted or absent; petals 4, free, or absent; stamens 4 or 8; ovary subinferior to inferior; fruit a capsule or a head of capsules.

The witch hazel family is composed of 20 genera and about 100 species, found mostly in temperate regions of the world. Two genera occur in Illinois.

KEY TO THE GENERA OF Hamamelidaceae IN ILLINOIS

1. Petals 4; stamens 4; flowers in small clusters; leaves toothed but unlobed; fruit a capsule ----- 1. *Hamamelis*
1. Petals 0; stamens numerous; flowers in dense, spherical heads; leaves toothed and lobed; fruit a spherical head of beaked capsules -----
----- 2. *Liquidambar*

1. *Hamamelis* L. —Witch Hazel

Trees or shrubs; winter buds without scales; leaves alternate, simple, toothed, with deciduous stipules; flowers perfect, borne in small clusters, bracteate; calyx 4-lobed; petals 4, free, linear; stamens 8, 4 of them fertile and 4 of them sterile; ovary subinferior; styles 2; fruit a 2-beaked capsule.

Hamamelis is a genus of about 6 species, with only the following occurring in Illinois.

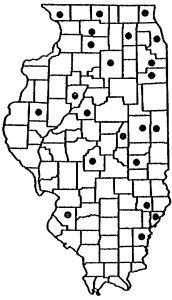
1. *Hamamelis virginiana* L. Sp. Pl. 124. 1753. Fig. 54.

Tree to 6 m tall, with a trunk up to 0.3 m in diameter, or often with several smaller trunks arising together; bark light brown, minutely scaly; winter buds ovoid, acute, orange-brown, finely pubescent,



54. *Hamamelis virginiana* (Witch Hazel). *a*. Leafy branch, $\times 1$. *b*. Winter twig and bud, $\times 2$. *c*. Flower buds and bracts, $\times 4$. *d*. Flowering branch, $\times 2$. *e*. Flower, $\times 8$. *f*. Cluster of open capsules, $\times 3$. *g*. Seed, $\times 10$.

up to 3 mm long; twigs slender, orange-brown to red-brown, pubescent at first but becoming glabrous; leaves obovate to suborbicular, obtuse to acute at the apex, rounded or subcordate or cuneate at the asymmetrical base, coarsely crenately toothed, dark green and usually glabrous above, pale green and glabrous below, except for the usually pubescent veins, up to 15 cm long, up to 6 cm broad, with petioles up to 2 cm long; flowers in small axillary clusters, short-pedicellate, bracteate; calyx 4-lobed, green, pubescent; petals 4, yellow, linear, up to 2 cm long; stamens 8; ovary half-inferior; capsules obovoid, orange-brown, pubescent, half-covered by the persistent calyx, up to 1.5 cm long; seeds hard, elongated, up to 5 mm long.



COMMON NAME: Witch Hazel.

HABITAT: Wooded slopes.

RANGE: Quebec to Minnesota, south to Missouri, Tennessee, and Georgia.

ILLINOIS DISTRIBUTION: Occasional in the northern half of the state, extending southward to Richland, Wabash, and White counties.

This is the latest native species to persist in flower in Illinois, blooming often until Christmas, frequently while snow is on the branchlets.

When the fruits are mature, they rupture with an audible explosion, casting the seeds for some distance.

The apparently complete absence of this species from the southern tip of Illinois is surprising.

Flowers of the witch hazel bloom from September to the end of December.

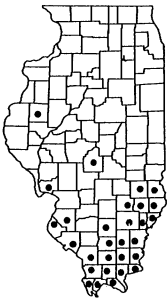
2. *Liquidambar* L. —Sweet Gum

Trees; monoecious; winter buds scaly; leaves alternate, simple, palmately lobed, toothed, with deciduous stipules; flowers unisexual, borne in racemes, bracteate; staminate flowers without sepals or petals and with numerous stamens; pistillate flowers with a reduced calyx, no petals, 4 aborted stamens, and a partly inferior ovary of 2 united carpels; fruit a spherical head of hardened capsules with curved styles, each capsule usually with 1 seed.

Liquidambar is a genus of two Asian species and the following North American species.

1. *Liquidambar styraciflua* L. Sp. Pl. 999. 1753. *Figs.* 55, 56.

Tree to 35 m tall, with a trunk up to 1.5 m in diameter, the branches forming a pyramidal crown; bark gray, becoming scaly; winter buds ovoid, up to 6 mm long, with many orange-brown scales; twigs reddish-brown at first, sometimes developing corky wings, often in an irregular pattern; leaves palmately 5- to 7-lobed, serrate, truncate or more or less subcordate at base, green on both sides, glabrous on the upper surface, glabrous except for tufts of hairs in the axils of the veins below, up to 15 cm across, with slender, usually glabrous petioles up to 15 cm long; staminate flowers in globose heads up to 6 mm in diameter, with several heads in a terminal raceme, the flowers subtended by hairy bracts; pistillate flowers in a solitary, globose head up to 12 mm in diameter, borne on long pendulous peduncles; fruit a globose head of ripened carpels, the head up to 3 cm in diameter; seeds light brown, winged, up to 1 cm long.



COMMON NAMES: Sweet Gum; Red Gum.

HABITAT: Low woods.

RANGE: Connecticut and New York, across Ohio to southern Illinois and southeastern Missouri, south to Texas and Florida; Mexico.

ILLINOIS DISTRIBUTION: Confined to the southern one-half of the state.

Sweet gum is one of the most beautiful trees native to Illinois. The wide variety of colors that the leaves show in the autumn is outstanding. The leaves, when crushed, yield a pleasant fragrance.

The close-grained, red-brown wood is valuable for cabinetmaking. The wood produces a fragrant, reddish resin.

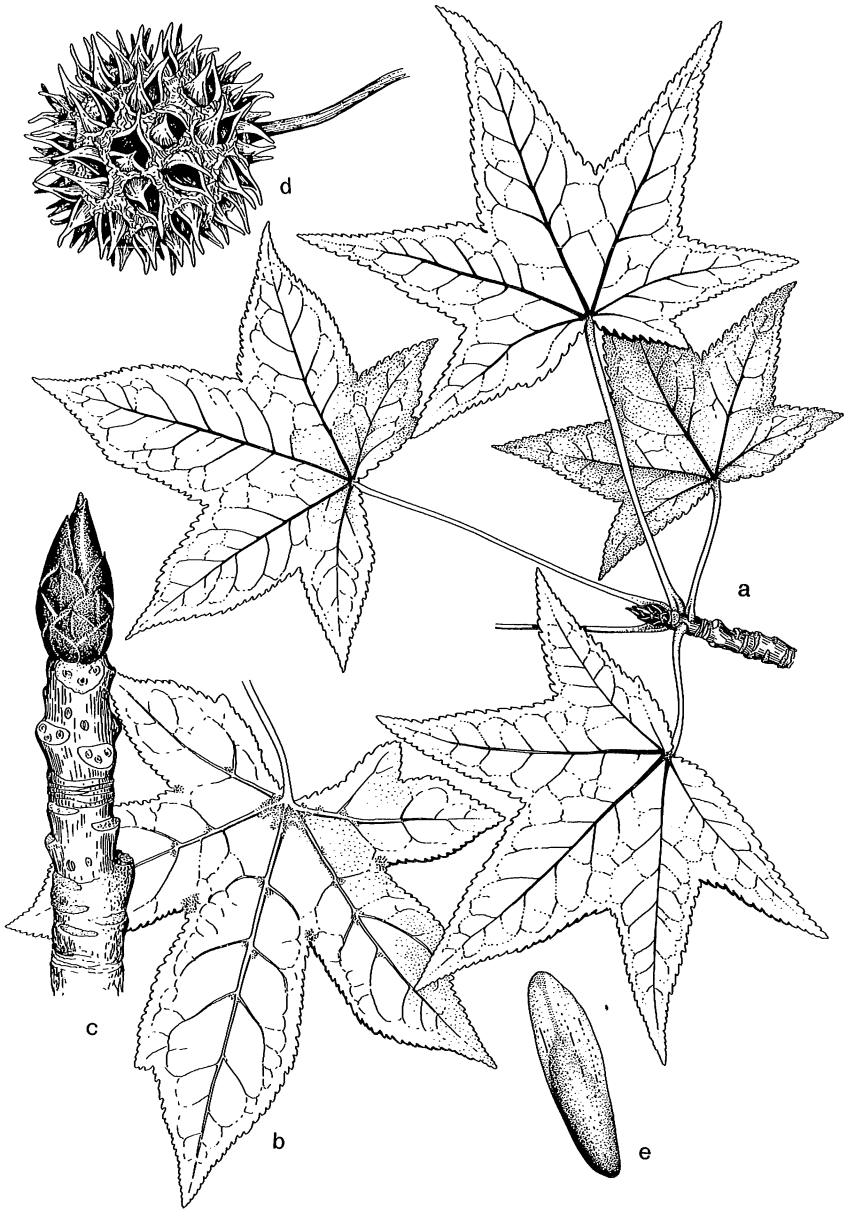
Although each fruiting head forms hundreds of seeds, most of the seeds are abortive and sawdustlike.

Some specimens produce heavy, corky wings on the branchlets, while other specimens are devoid of the wings.

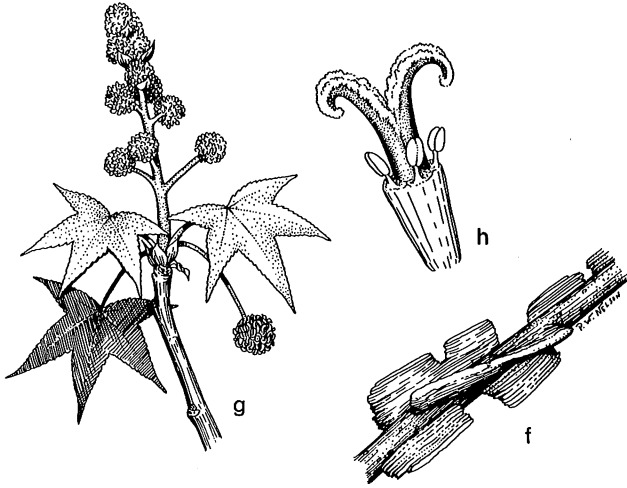
The flowers of the sweet gum are produced from April to early May.

PLATANACEAE—SYCAMORE FAMILY

Only the following genus comprises the family.



55. *Liquidambar styraciflua* (Sweet Gum; Red Gum). *a*. Leafy branch, $\times 1$. *b*. Leaf, $\times 1$. *c*. Winter twig and bud, $\times 2$. *d*. Fruiting head, $\times 3$. *e*. Seed, $\times 8$.



56. *Liquidambar styraciflua* (Sweet Gum; Red Gum). *f.* Twig with corky wings, $\times 1$. *g.* Flowering branch, $\times 1$. *h.* Flower, $\times 20$.

1. *Platanus* L. —Sycamore; Plane Tree

Monoecious trees with thick, furrowed bark separating from branches and younger trunk in large plates; leaves simple, alternate, broad and lobed with sheathing, persistent stipules; staminate flowers in heads on axillary peduncles; pistillate flowers in heads on long, terminal peduncles; fruit a nutlet, light brown, obovoid, 1-seeded with persistent styles.

Three species of this genus are found in the United States. *Platanus occidentalis* L. occurs in the eastern forests; *P. racemosa* Nutt. and *P. wrightii* S. Wats. occur in the western United States. All resemble each other in having broad, lobed leaves with petioles inflated at the base and encircling the bud, and in scaly deciduous bark.

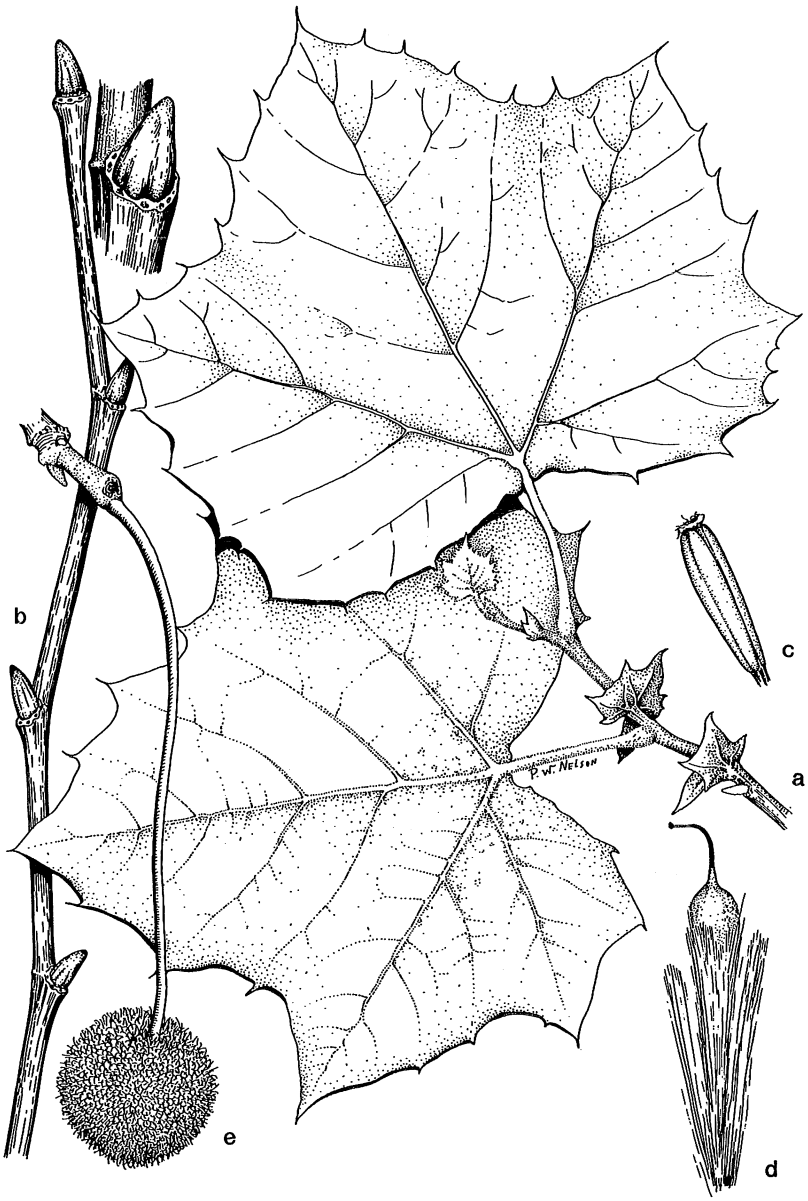
Only the following species occurs in Illinois.

1. *Platanus occidentalis* L. Sp. Pl. 999. 1753. *Fig.* 57.

Platanus glabrata Fern. Proc. Am. Acad. Arts & Sci. 36:493. 1901.

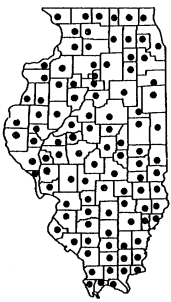
Platanus occidentalis L. var. *glabrata* (Fern.) Sarg. Bot. Gaz. 67:230. 1919.

Platanus occidentalis L. var. *attenuata* Sarg. Man. Trees N. Am. 372. 1922.



57. *Platanus occidentalis* (Sycamore; Plane Tree). a. Leafy branch, with stipules, $\times 1$. b. Winter twig and buds, $\times 2$. c. Stamen, $\times 20$. d. Ovary, $\times 20$. e. Fruiting head, $\times 1\frac{1}{2}$.

Large trees to 30 m tall, trunk up to 3 m in diameter, the crown broad; bark scaly, separating from the young trunk and branches, light brown; twigs terete, becoming glabrous, orange-brown in the first year, light brown by the second; buds light brown, ovoid, acute, up to 1 cm long; leaves broadly ovate, with 3–5 sharp-pointed, shallow lobes, glabrous or nearly so at maturity; petioles up to 20 cm long, terete, puberulent, inflated at the base and enclosing the bud; staminate flowers with 3–6 stamens, 3–6 sepals, 3–6 petals; pistillate flowers with a calyx of 3–6 parts, 3–6 petals, and 1 or rarely 2 superior ovaries; fruit a nutlet, obovate, light brown, in heads of drooping peduncles, subtended by numerous soft bristles.



COMMON NAME: Sycamore; Plane Tree.

HABITAT: Bottomlands; along rivers, streams, and lakes.

RANGE: Maine to southern Wisconsin and eastern Nebraska, south to eastern Texas, east to northern Florida.

ILLINOIS DISTRIBUTION: Throughout the state; in every county.

Sycamore is easily recognized by its scaly, brown and gray, mottled bark and large, palmately lobed leaves.

The sycamore is a widely used ornamental of park and lawn because of its bark and leaf characters. It trans-

plants easily and growth is relatively fast.

The wood is hard and durable and has been used for making furniture and for interior finishing.

Flowers bloom from April to May.

Order Fagales

The Fagales, as treated by Thorne (1968), consists of two families, the Fagaceae and the Betulaceae. This is a departure from the system of Cronquist (1981), in which the Balanopaceae, a monotypic family known only from New Caledonia, is also included. Thorne's system has the Balanopaceae in its own order. Both Thorne and Cronquist retain the Corylaceae (*sensu* Hutchinson, 1959) in the Betulaceae. The Fagaceae and Betulaceae are well represented in the Illinois flora.

Characteristics that unite families of the Fagales include: plants monoecious (*Nothofagus* is dioecious); pistillate flowers with an inferior, 1- to 6-locular ovary containing 2 or more ovules that are unitegmic or bitegmic; fruit a 1-seeded nut without endosperm; leaves stipulate, simple, entire or variously indented, typically pubescent at maturity.

FAGACEAE—BEECH FAMILY

Monoecious trees or shrubs with alternate, simple leaves and narrow, deciduous stipules; staminate flowers in pendulous or erect aments or heads; pistillate flowers solitary or in clusters of 2–4, subtended by an involucre of bracts that persists in fruit as an indurated cupule or other envelope; ovary inferior and with 1 or 2 pendulous ovules per locule; fruit a one-seeded (by abortion) nut lacking endosperm; ovules bitegmic.

The beech family contains six genera and more than 600 species. The family is represented in Illinois by *Fagus*, *Castanea*, and *Quercus*.

KEY TO THE GENERA OF Fagaceae IN ILLINOIS

1. Apical buds solitary or absent; leaves sharply serrate; pistillate flowers spiny; involucre persistent and spiny; nut compressed _____ 2
1. Apical buds 3 or more; leaves entire, lobed, dentate, or serrate; pistillate flowers not spiny; involucre persistent in fruit but not spiny; nut not compressed _____ 3. *Quercus*

2. Apical bud solitary; staminate flowers in drooping, globose clusters; nut sharply 3-angled ----- 1. *Fagus*
2. Apical buds absent; staminate flowers in slender, ascending aments; nut subglobose, flattened on 1 or 2 sides ----- 2. *Castanea*

1. *Fagus* L. —Beech

Trees with smooth gray bark; twigs slender, terete, with solid pith; buds linear, sharp-pointed, often twice as long as broad; leaves alternate, simple, serrate; staminate flowers in pendulous heads; stamens 8–16; pistillate flowers usually in pairs subtended by numerous bracts; ovary 3-locular, with 2 ovules per locule; fruit a nut, usually in pairs in a prickly, 4-valved involucre.

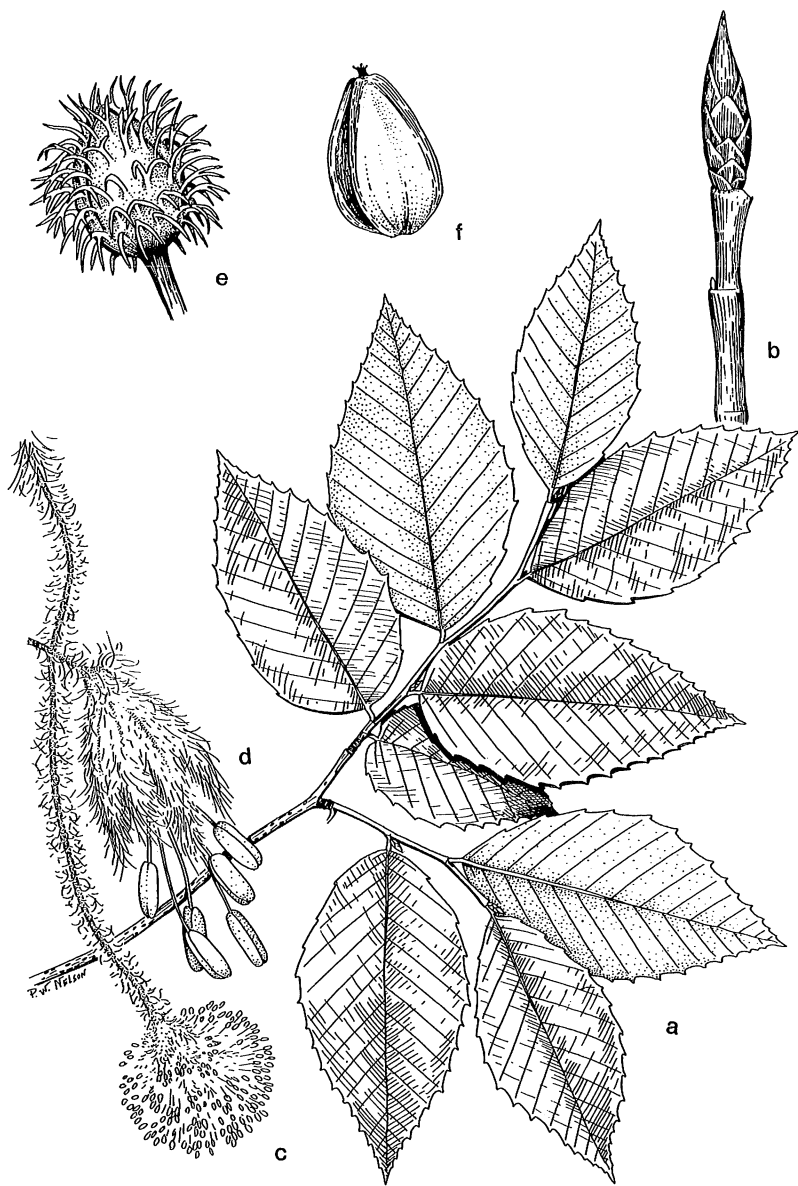
Fagus is a genus of the northern hemisphere with one species, *F. grandifolia*, in North America and seven in the Old World. Copper beech and weeping beech are varieties of the European *F. sylvatica* cultivated in the United States for their attractive foliage or graceful lines.

1. *Fagus grandifolia* Ehr. var. *caroliniana* (Loud.) Fern. & Rehd. *Rhodora* 9:114. 1907. *Fig.* 58.

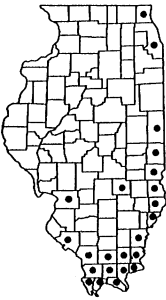
Fagus americana Sweet, *Hort. Brit.* 370. 1826.

Fagus ferruginea Ait. var. *caroliniana* Loud. *Arb. Frut. Brit.* 3:1980. 1838.

Tree commonly 25–30 m tall, the trunk up to 1.5 m in diameter, the crowns broad and rounded in open situations; bark smooth, gray; twigs slender, ashy gray, glabrous, with a distinct horizontal spread; buds acuminate, puberulent at the apex, up to 3 cm long and 0.5 cm broad, reddish; leaves oblong-ovate, 5–12 cm in length and 2–8 cm in width, the margins sharply serrate, pubescent beneath on veins or generally over entire surface; the petioles hairy, up to 4 cm in length; staminate flowers in globose heads on drooping peduncles, the calyx 4- to 8-lobed; stamens 8–16; pistillate flowers in clusters of 2–4, subtended by a 4-valved involucre of hairy bracts, the calyx 4- or 5-lobed, the ovary 3-locular with 2 ovules per cell; fruit a triangular nut usually in clusters of 3, partly or nearly enclosed by a woody involucre bearing numerous recurved prickles.



58. *Fagus grandifolia* var. *caroliniana* (Beech). a. Leafy branch, $\times 1$. b. Winter twig and bud, $\times 2$. c. Staminate inflorescence, $\times 5$. d. Staminate flower, $\times 20$. e. Capsule, $\times 5$. f. Nut, $\times 10$.



COMMON NAME: Beech.

HABITAT: Typically in rich, moist woods, but occasionally on bluffs.

RANGE: Southern Canada from Nova Scotia to eastern Ontario, south to southern Missouri and eastern Texas, east to Florida.

ILLINOIS DISTRIBUTION: Occasional in the southernmost counties, along the eastern border in the southern one-half of the state, and in Vermilion, Cook, and Lake counties to the north.

Two varieties of beech are recognized. Illinois plants are referable to var. *caroliniana*. These differ from the more eastern var. *grandifolia* by shorter prickles on the fruit (1–3 mm) and thicker leaves that are more acuminate.

The beech is easily recognized by its long, pointed buds, prickly fruit, and smooth, gray bark. However, the same bark that adds to its handsome features makes a favorite surface for those who would mar it with carvings. So many have been defaced in this manner that it is known locally as the “pocketknife tree.”

Beech wood is hard and close-grained, but is not an important lumber source due to the paucity of trees. Uses for the wood have included pulp in paper production and manufacture of barrel staves and furniture.

The nuts are sweet and a source of oil.

In autumn the leaves turn a pale yellow, providing an attractive contrast with the gray bark. The plants, although quite attractive in the forest setting, are not used extensively in landscaping homes because of the difficulty of transplanting.

The flowers bloom from April to May.

2. *Castanea* Mill. –Chestnut

Trees or shrubs with furrowed bark; twigs terete, slender, glabrous or pubescent; buds ovate, acute, absent from the shoot apex; leaves ovate to lanceolate, glabrous or hairy, coarsely serrate, petioles to 4 cm long, terete, glabrous or minutely puberulent; flowers unisexual, the staminate in aments with interrupted clusters of 3–7 flowers, calyx 6-lobed, stamens 6–20, the pistillate solitary or in spicate clusters of 2–3 at the base of staminate aments, subtended by a scaly, prickly involucre, calyx 6-parted, ovary with 6–14 ovules, each 3- to 7-locular, sterile stamens 5–12; fruit a nut, usually 2–3 enclosed in the coriaceous involucre.

Castanea, like *Fagus*, is a genus of the northern hemisphere. Of the seven species that comprise it, *C. dentata*, *C. ozarkensis*, and *C. pumila* are native to the United States. Other species are found in Europe, North Africa, Japan, Korea, and China. Two of these, the European *C. sativa* and the oriental *C. mollissima*, are cultivated in the United States for their edible nuts.

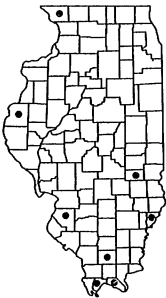
KEY TO THE SPECIES OF *Castanea* IN ILLINOIS

1. Leaves glabrous; buds glabrous ----- 1. *C. dentata*
 1. Leaves pubescent; buds pubescent ----- 2. *C. mollissima*

1. *Castanea dentata* (Marsh.) Borkh. Theor.-prakt. Handb. Forstbot. 1:741. 1800. Fig. 59.

Castanea americana Raf. Fl. Ludovic. 134. 1817.

Tree to 30 m, with furrowed bark; leaves oblong-lanceolate, acuminate, sharply and coarsely serrate, glabrous, on petioles up to 4 cm long; staminate aments up to 25 cm in length; pistillate flowers at base of staminate aments, spicate, in pairs of 3 together; fruit enclosed in a spiny involucre, the nuts ovoid, usually 2 or 3 together, compressed respectively on 1 or 2 sides.



COMMON NAME: American Chestnut.

HABITAT: Acid, rocky uplands.

RANGE: Originally throughout the eastern United States from Maine to southern Michigan, south to southern Illinois and Kentucky, east to Delaware.

ILLINOIS DISTRIBUTION: Previously found in several counties, but now known only from scattered counties where it may have been planted.

The American chestnut was once widely distributed in the forests of the eastern United States. Its wood was used in making furniture, for pulp in paper production, and as fence posts, railroad ties, and telegraph poles. The nuts are sweet and were once sold by street vendors in the major eastern cities.

The following account of the American chestnut in Illinois is taken from Miller and Tehon's *Native and Naturalized Trees of Illinois* (1926):



59. *Castanea dentata* (American Chestnut). *a.* Leafy branch with staminate inflorescences and young fruits, $\times 1$. *b.* Winter twig and buds, $\times 2$. *c.* Pistil, $\times 20$. *d.* Fruit, $\times 1$. *e.* Seed, $\times 1\frac{1}{2}$.

In Illinois, it is found native only near Olmstead, in Pulaski County, where there is a grove of trees, some 80 acres in extent, on rolling clay ridges. These trees . . . were described by the Rev. E. B. Olmstead in 1876 in the following words: "I suppose that these trees are indigenous. They grow on a ridge . . . about a quarter of a mile from the Ohio River and overlooking it. . . . I took a position in their midst today, and counted, without moving, thirty-five beautiful and symmetrical trees, averaging in diameter about 22 inches, and in height 50 or 60 feet. When I came to this place in 1839 there were a great many more than at present. About 25 years ago I saw a tree cut down and worked up into rails. It was immensely tall and four or five cuts were taken off for rails ten feet long. I measured the stump of that tree today . . . and making allowance for sap and bark which are gone, found it six feet, two inches, three feet from the ground. . . . the noble tree was 250 years old when it was cut down. . . . No doubt the Indians for many generations built their council fires under their [*sic*] branches."

In 1949 I attempted to rediscover the site of this chestnut stand near Olmstead. One old native who must have been in his eighties advised me that "they ain't a chestnut tree in the whole United States, not even a sprout!"

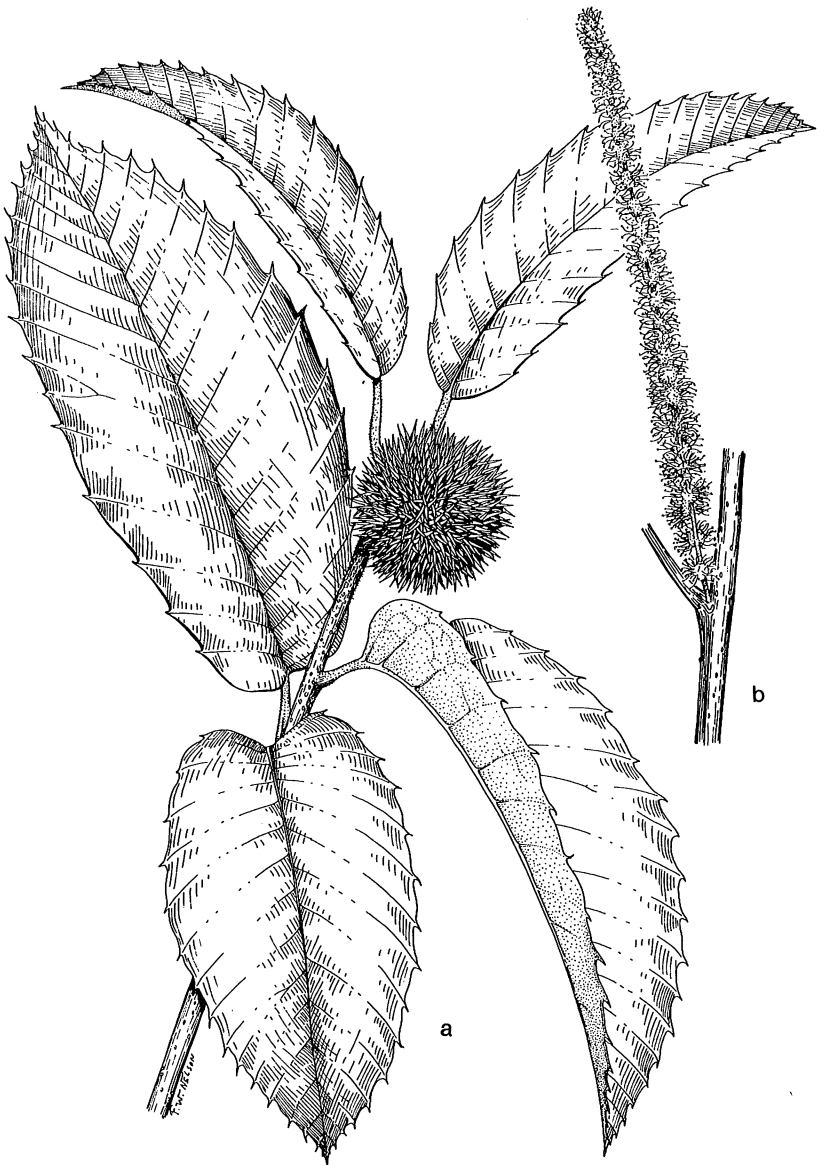
The chestnut has been all but eliminated by the attack of a fungus, *Endothia parasitica* Anders. Only a handful of trees at scattered locations in the state remain. Most or all of these were probably planted.

The chestnut was a symbol of strength in Longfellow's "The Village Blacksmith." Like the blacksmith, the chestnut now represents an age gone by.

The trees flower from May through July.

2. *Castanea mollissima* Blume, Mus. Bot. Lugd. Bat. 286. 1849. Fig. 60.

Shrub or small tree to 18 m tall, trunk up to 20 cm in diameter, crown spreading; bark furrowed, brown; twigs covered by long coarse hairs, terete; buds ovoid, pubescent, brown; leaves oblong-lanceolate, to 20 cm long, acuminate, coarsely serrate, tomentose beneath; staminate flowers in showy aments, single or fascicled; pistillate flowers in clusters of 2 or 3 subtended by a prickly involucre; fruit a nut up to 3 cm across, in pairs of 3's, enclosed by spiny valves that are pubescent.



60. *Castanea mollissima* (Chinese Chestnut). *a.* Leafy branch, with fruits, $\times 1$. *b.* Staminate catkin, $\times 3$.



COMMON NAME: Chinese Chestnut.

HABITAT: Dry upland woods.

RANGE: Scattered but rarely escaped in the eastern United States.

ILLINOIS DISTRIBUTION: Known only from Jackson and Randolph counties.

Chinese chestnut is a native of Korea and China. In these countries it is grown for the food value of its nuts. In America the plants are cultivated more for ornamental purposes than food value, as it is seemingly not affected by the chestnut blight.

The wood is similar to that of *C. dentata*, but due to the plant's rather small stature and rarity, it is of no commercial value as a timber tree in the United States.

Chinese chestnut is an escape that has become established in dry woods in Jackson and Randolph counties.

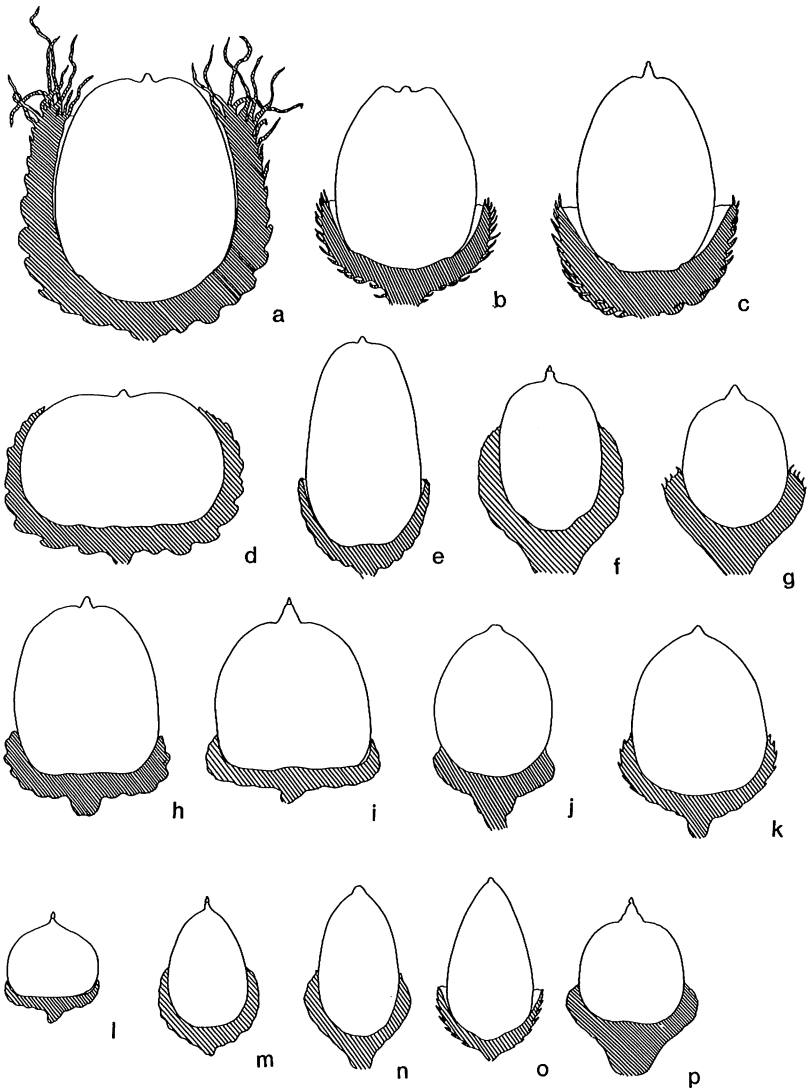
Flowers bloom from June to July.

3. *Quercus* L. -Oak

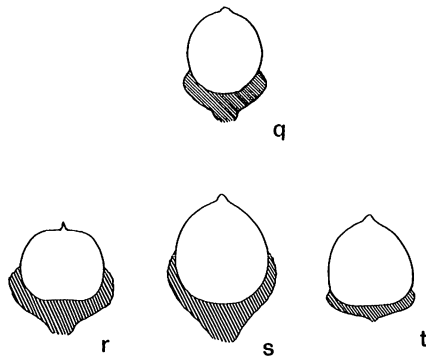
Trees; leaves alternate, simple, entire or variously indented, the stipules caducous; plants monoecious, the staminate flowers in pendulous aments of 6-20 flowers, the calyx with 3-7 elements, the stamens 3-12; pistillate flowers solitary or in groups of 2 or 3, subtended by an involucre of many parts, the ovule 1-seeded by abortion, 3-locular; fruit a nut, subtended by, and partly or nearly enclosed in, an indurated involucre.

The oaks are a familiar group to students of the North American flora. The plants have been the concern of numerous studies, but not the subject of a monograph since the work of Trelease (1924). In the interval, the oaks may have been neglected because they are too familiar or because there is a lack of dependable markers upon which to circumscribe species. Mature fruits are often necessary for positive identification. (See Figs. 61 and 62.)

Resolution of the problem of delineating species has been given some assistance by Hardin (1976) in a study of foliar trichomes that resulted in an enumeration of structural types. Thomson and Mohlenbrock (1979) have shown that when combined with the quantitative features such as number of rays and spread (tip to tip extent of the rays), trichomes provide consistent markers for distinguishing species of eastern white oaks. Similar studies have not been forthcoming for the red oaks.



61. Diagrams of acorns, showing relative length of cup to nut and relative size of acorns. a. *Q. macrocarpa* (Bur Oak; Mossy-cup Oak). b. *Q. bicolor* (Swamp White Oak). c. *Q. michauxii* (Swamp Chestnut Oak; Basket Oak; Cow Oak). d. *Q. lyrata* (Overcup Oak). e. *Q. montana* (Rock Chestnut Oak). f. *Q. coccinea* (Scarlet Oak). g. *Q. velutina* (Black Oak). h. *Q. alba* (White Oak). i. *Q. rubra* (Northern Red Oak). j. *Q. nuttallii* (Nuttall's Oak). k. *Q. shumardii* (Shumard's Oak). l. *Q. palustris* (Pin Oak). m. *Q. stellata* (Post Oak). n. *Q. ellipsoidalis* (Hill's Oak). o. *Q. prinoides* var. *acuminata* (Chinquapin Oak; Yellow Chestnut Oak). p. *Q. falcata* (Spanish Oak).

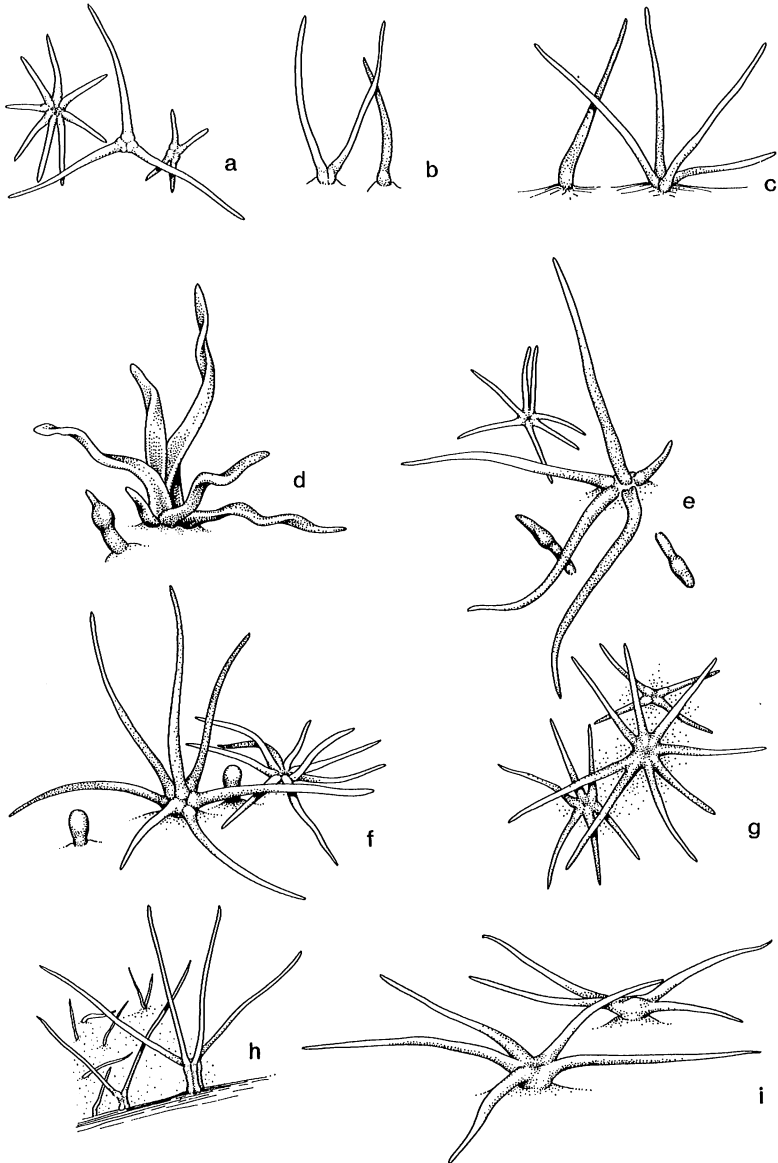


62. Diagrams of acorns (continued). *q.* *Q. imbricaria* (Shingle Oak). *r.* *Q. marilandica* (Blackjack Oak). *s.* *Q. phellos* (Willow Oak). *t.* *Q. pagoda* (Cherrybark Oak).

Because of the importance of foliar trichomes to *Quercus* taxonomy, a discussion of the types is provided. Illustrations of the trichomes are included with those of the species. All references to trichomes pertain to those of the abaxial leaf surface. (See Fig. 63.)

Foliar trichomes are resolved in two distinct size order when viewed microscopically. The smaller are visible only with enlargement of $40\times$ or greater. These have been referred to as "glandular" in the literature (Dyal, 1936) for their shiny appearance. They are of little taxonomic value and are not included in the description of species. The larger trichomes are visible at $10\times$ and are called "nonglandular." Individual types of this class are distinguished by whether they are unicellular or multicellular, by the orientation of rays, and by the degree and orientation (horizontal or vertical) of ray fusion. The types include solitary, stellate, fused-stellate, fasciculate, stipitate-fasciculate, and multiradiate.

The genus is divided into two subgenera. In subgenus *Quercus*, the white oaks, the fruits mature in the same season in which the flowers develop, the veins of the leaves do not extend beyond the margin (i.e., not bristle-tipped), and foliar trichomes are solitary, stellate, fused-stellate, fasciculate, and stipitate-fasciculate. In subgenus *Erythrobalanus*, the red and black oaks, the fruits mature by the end of the second season, the leaves are bristle-tipped, and the trichomes are solitary, fasciculate, stipitate-fasciculate, and multiradiate.



63. Leaf trichome types of various members of the white oak group. a, b. *Q. lyrata* (Overcup Oak). c. *Q. michauxii* (Swamp Chestnut Oak; Basket Oak; Cow Oak). d. *Q. alba* (White Oak). e. *Q. macrocarpa* (Bur Oak; Mossy-cup Oak). f. *Q. bicolor* (Swamp White Oak). g. *Q. prinoides* var. *acuminata* (Chinquapin Oak; Yellow Chestnut Oak). h. *Q. montana* (Rock Chestnut Oak). i. *Q. stellata* (Post Oak).

KEY TO THE SPECIES OF *Quercus* IN ILLINOIS

1. Leaves with bristle tips; fruit maturing in the second year; trichomes solitary, fasciculate, stipitate-fasciculate, and multiradiate. Subgenus *Erythrobalanus*. Red and Black Oaks ----- 2
1. Leaves without bristle tips; fruit maturing in one year; trichomes solitary, stellate, fasciculate, and stipitate-fasciculate. Subgenus *Quercus*.
White Oaks ----- 12
 2. Leaves entire ----- 3
 2. Leaves lobed ----- 4
3. Lower surface of mature leaves pubescent only in the axils of primary veins ----- 1. *Q. phellos*
3. Lower surface of mature leaves generally pubescent, the hairs not restricted to vein axils ----- 2. *Q. imbricaria*
4. Lower surface of mature leaves pubescent only in the axils of primary veins ----- 5
4. Lower surface of mature leaves generally pubescent, the hairs not restricted to vein axils ----- 11
5. Winter buds glabrous ----- 6
5. Winter buds pubescent ----- 7
 6. Buds gray ----- 3. *Q. shumardii*
 6. Buds chestnut-brown ----- 4. *Q. rubra*
7. Buds gray, tomentose, or covered with fine, silky, or appressed hairs; terminal bud 0.5 cm long or longer; inner bark yellow ----- 8
7. Buds not as above, with only the upper bud scales pubescent or the scales ciliate; terminal bud less than 0.5 cm long; inner bark brown, tan, or reddish ----- 9
 8. Buds woolly, 0.6–1.2 cm long; upper scales of the acorn cup imbricate ----- 5. *Q. velutina*
 8. Buds silky, 0.5–0.7 cm long; upper scales of the acorn cup appressed ----- 6. *Q. ellipsoidalis*
9. Upper bud scales pubescent ----- 7. *Q. coccinea*
9. Upper bud scales ciliate ----- 10
 10. Acorn cup saucer-shaped, sessile; nut spheroid -- 8. *Q. palustris*
 10. Acorn cup turbinate, stipitate; nut cylindrical ---- 9. *Q. nuttallii*
11. Leaves broadly obovate in outline, with shallow sinuses ----- 10. *Q. marilandica*
11. Leaves ovate to oblong in outline, with more or less deep sinuses 12
 12. One or more lobes falcate ----- 11. *Q. falcata*
 12. All of the lobes straight or nearly so ----- 13
13. Buds gray-tomentose, 0.6 cm long or longer ----- 5. *Q. velutina*
13. Buds not gray-tomentose, less than 0.5 cm long ----- 12. *Q. pagoda*

- 14. Foliar trichomes caducous; leaves glabrous at maturity -----
----- 13. *Q. alba*
- 14. Foliar trichomes persistent; leaves pubescent at maturity ---- 15
- 15. Leaves with serrate or dentate margins ----- 16
- 15. Leaves lobed ----- 18
- 16. Leaves coarsely serrate, the teeth mucronate -- 14. *Q. prinoides*
- 16. Leaves dentate ----- 17
- 17. Foliar trichomes densest at vein axils, producing a tufted appearance;
petioles glabrous ----- 15. *Q. montana*
- 17. Foliar trichomes occurring uniformly on the lower surface, not tufted;
petioles hairy ----- 16. *Q. michauxii*
- 18. Sinuses shallow (extending less than ½ the distance from margin to
midrib), often asymmetrical; fruiting peduncles exceeding the peti-
oles in length by twice or more ----- 17. *Q. bicolor*
- 18. Sinuses deep (extending ½ or more the distance from margin to
midrib), symmetrical; fruiting peduncles not exceeding the petioles
in length by twice or more ----- 19
- 19. Lobing unequal, the deepest sinuses occurring below the middle of
the blade; acorn cup fringed ----- 18. *Q. macrocarpa*
- 19. Lobing equal, sinuses above and below middle of the blade nearly as
deep; acorn cup not fringed ----- 20
- 20. Twigs orange-brown, pubescent; mature leaves orange-tomentose
below; acorn cup covering the nut by ⅓ to ½ ---- 19. *Q. stellata*
- 20. Twigs grayish-brown, glabrous; mature leaves white-tomentose or
glabrate below; acorn cup covering the nut completely or nearly so
----- 20. *Q. lyrata*

As discussed above, when the various structural types of foliar trichomes are combined with the quantitative features such as the number of rays and spread, a useful set of characteristics for distinguishing white oak species results. The following key is provided as an alternate for subgenus *Quercus* in Illinois. A hand lens with magnification of at least 10× will be required to make use of the key. It is recommended that the interested reader consult Thomson and Mohlenbrock (1979) and view specimens with a dissecting microscope at 40× or greater until becoming familiar with trichome morphology.

**KEY TO THE ILLINOIS SPECIES OF *Quercus* SUBGENUS *Quercus*
BASED ON FOLIAR TRICHOMES**

1. Mature leaves pubescent on the abaxial surface due to the presence of nonglandular trichomes of the stellate or fasciculate type, or fasciculate hairs in combination with solitary, stipitate-fasciculate, or stellate ones ----- 2
1. Mature leaves glabrous on the abaxial surface----- 13. *Q. alba*
 2. Nonglandular trichomes of the stellate type only - 14. *Q. prinoides*
 2. Nonglandular trichomes fasciculate only, or these in addition to solitary, stipitate-fasciculate, or stellate ones----- 3
 3. Nonglandular trichomes fasciculate ----- 4
 3. Nonglandular trichomes a combination of fasciculate with solitary, stipitate-fasciculate, or stellate ones ----- 6
 4. Ray braches flattened and twisted ----- 13. *Q. alba*
 4. Ray branches neither flattened nor twisted ----- 5
5. Hairs arising from midvein and primary veins on pedestals; rays 4-9 (typically 8) ----- 19. *Q. stellata*
5. Hairs arising from midvein and primary and secondary veins, but not attached to pedestals; rays 4-9 (typically 4) ----- 14. *Q. prinoides*
 6. Trichomes of fasciculate and solitary types ----- 7
 6. Trichomes some combination other than above ----- 8
7. Fasciculate hairs with 2-4 rays (typically 2); leaves sparsely pubescent - ----- 20. *Q. lyrata*
7. Fasciculate hairs with 2-8 rays (typically 4); leaves densely pubescent - ----- 16. *Q. michauxii*
 8. Trichomes fasciculate and stipitate-fasciculate, the latter occurring in vein axils making the pubescence appear tufted--- 15. *Q. montana*
 8. Trichomes fasciculate and stellate ----- 9
9. Nonglandular hairs whitened, dense, with red glandular hairs occurring among them ----- 17. *Q. bicolor*
9. Nonglandular hairs whitened or yellowish, dense or sparse, but not associated with red, glandular hairs ----- 10
 10. Fasciculate hairs with 2-9 rays (typically 4) and an average spread of 0.30 mm or greater; stellate hairs with 4-16 rays (typically 8)--- ----- 18. *Q. macrocarpa*
 10. Fasciculate hairs with 2-6 rays (typically 4) and an average spread of less than 0.30 mm; stellate hairs with 6-16 rays (typically 12)--- ----- 20. *Q. lyrata*

1. *Quercus phellos* L. Sp. Pl. 994. 1753. Fig. 64.

Tree up to 25 m tall, the trunk up to 1.2 m in diameter, the crown narrowly rounded; bark thin, shallowly fissured, reddish-brown; twigs slender, terete, glabrous, reddish-brown; buds ovoid, acute, smooth, reddish-brown, up to 0.5 cm long; leaves lanceolate to narrowly oblong, entire, 5–12 cm long, 0.5–3.0 cm wide, trichomes solitary and fasciculate, confined mainly to primary vein axils; petioles stout, glabrous, less than 0.5 cm long; staminate inflorescence slender, 5–8 cm long, calyx yellow; pistillate inflorescence 1- to 3-flowered, on slender hairy peduncles; fruit solitary or in pairs, sessile or nearly so, the nut hemispheric, 0.5–1.0 cm in diameter, the cup saucer-shaped, enclosing the nut by $\frac{1}{4}$.



COMMON NAME: Willow Oak.

HABITAT: Low woods.

RANGE: New York to southern Illinois and eastern Oklahoma, south to eastern Texas, east to Florida.

ILLINOIS DISTRIBUTION: Known from only the southernmost counties.

Willow oak is so named because of the resemblance of the shape of its leaves to those of some willows. Here the similarity ends, and the likelihood of confusion with any willow seems slight, especially when the acorns are apparent.

Quercus phellos, like *Q. imbricaria*, has unlobed leaves, but may be distinguished from the shingle oak by its generally narrower leaves, which are pubescent only in the vein axils.

Willow oak is not abundant in Illinois. It is confined to low or swampy woods, but is not a major component of bottomland forests here. Further to the south, the trees are included in landscaping homes and parks. This species is also an important lumber source in the South. The wood is hard, durable, and suited to many uses. It has been shaped into both church pews and bar tops.

The plants are known to have formed hybrids with *Q. palustris* (*Q. X schochiana* Dieck) and *Q. velutina* (*Q. X filialis* Little) in Illinois.

The trees flower from April to May.



64. *Quercus phellos* (Willow Oak). *a.* Leafy branch, $\times 1\frac{1}{2}$. *b.* Winter twig and buds, $\times 3$. *c.* Staminate flowers, $\times 20$. *d.* Pistillate flowers, $\times 20$. *e.* Acorn, $\times 5$.

2. *Quercus imbricaria* Michx. Hist. Chenes Am. pl. 15–16.
1801. Figs. 65, 66.

Tree up to 25 m tall, the trunk up to 1 m in diameter, the crown rounded or oblong, the upper branches ascending, the lower pendulous and often persistent; bark tight, furrowed, dark brown; twigs slender, glabrous, reddish-brown, buds ovoid, acute, up to 0.5 cm long, smooth, reddish-brown; leaves lanceolate to oblong, entire, 9–16 cm long, 2–5 cm wide, the abaxial surface covered by stipitate-fasciculate trichomes; petioles stout, up to 2 cm long, pubescent; staminate inflorescence hairy, up to 8 cm long, calyx yellow; pistillate inflorescence 1- to 3-flowered on slender peduncles, pubescent, stigmas green; fruit solitary or in pairs on short, stout peduncles, the nut ovoid, glabrous, dark brown, striate, 1–2 cm long, up to 1.5 cm in diameter, enclosed by a saucer- to turbinate-shaped cup $\frac{1}{3}$ to $\frac{1}{2}$ its length.



COMMON NAME: Shingle Oak.

HABITAT: Occasional on dry upland soils, or on moist soils in woods, or along streams.

RANGE: New Jersey to southern Wisconsin, Iowa, and eastern Nebraska, south to eastern Kansas and Oklahoma, east to Arkansas and South Carolina.

ILLINOIS DISTRIBUTION: Throughout the state; doubtless in every county.

Quercus imbricaria and *Q. phellos* are the only Illinois oaks whose leaves have entire margins.

Shingle oak has stipitate-fasciculate trichomes covering the lower surface of the leaves. Trichomes of willow oak are fasciculate and restricted to vein axils.

Tradition has it that André Michaux in 1794 observed French settlers in Kaskaskia using the wood of this oak to form roofing shingles. Michaux translated the word for shingle into Latin when he named this species. The wood is still reportedly split for shingles in some parts of the South.

The trees have been planted for wind breaks and for ornament. The leaves turn brown or reddish in autumn and often remain on the trees long into winter.

Hybrids between shingle oak and *Q. falcata* (*Q. X anceps* E. J. Palmer, type from Rosiclare, Hardin Co.), *Q. marilandica* (*Q. X tridentata* [A. DC.] Engelm., type 6 miles east of St. Louis), *Q. palustris* (*Q. X exacta* Trel.), *Q. rubra* (*Q. X runcinata* [A. DC.]



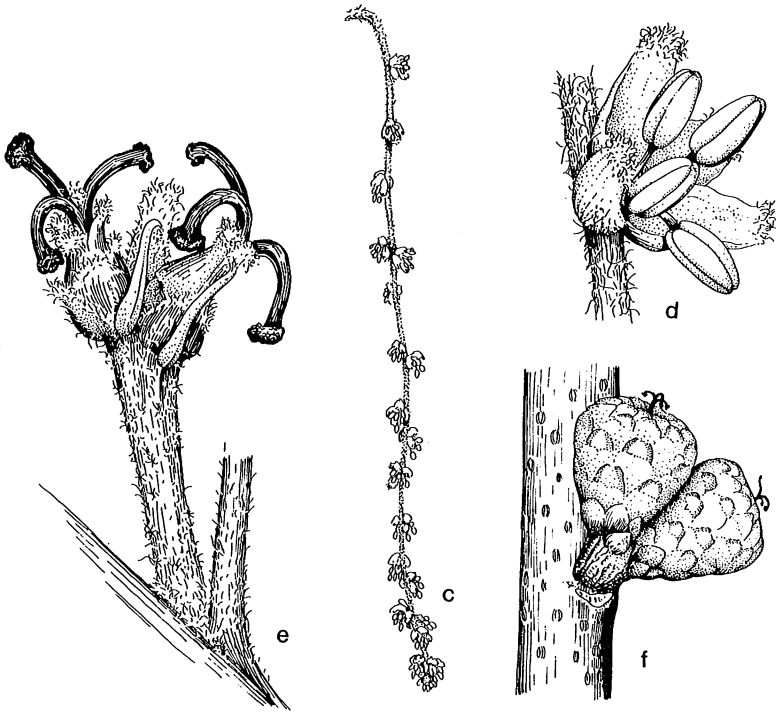
65. *Quercus imbricaria* (Shingle Oak). a. Leafy branch with acorns, $\times 1\frac{1}{2}$. b. Winter twig and buds, $\times 3$.

Engelm., type from Madison or St. Clair counties, Illinois), and *Q. velutina* (*Q. X leana* Nutt.) have been reported for Illinois.

The flowers appear in April and remain into May.

3. *Quercus shumardii* Buckl. Proc. Acad. Nat. Sci. Phila. 12:444. 1860.

Tree up to 35 m tall, the trunk up to 1.8 m in diameter, the crown spreading; bark thick, furrowed or divided into scaly plates, dark



66. *Quercus imbricaria* (Shingle Oak). c. Staminate catkin, $\times 3$. d. Staminate flower, $\times 30$. e. Pistillate flowers, $\times 30$. f. Young fruits, $\times 5$.

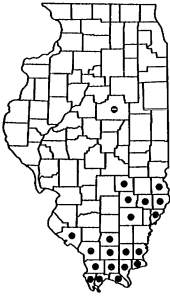
brown; twigs glabrous, gray or grayish-brown; buds ovoid, acute, gray, glabrous, less than 0.5 cm long; leaves 5- to 7-lobed with broad, round sinuses, obovate, 12–22 cm long, 8–12 cm wide, the abaxial surface with axillary tufts of fasciculate and multiradiate trichomes; petioles slender, glabrous, up to 8 cm long; staminate inflorescence up to 20 cm long, slender, slightly villous; pistillate inflorescence 1- to 3-flowered, peduncles hairy; fruit in pairs or solitary, the nut ovoid, 2–4 cm long, up to 3 cm in diameter, enclosed $\frac{1}{4}$ – $\frac{1}{3}$ its length or more by a thick, saucer-shaped to rounded cup.

Two varieties of *Q. shumardii* may be distinguished in Illinois.

1. Acorn cup saucer-shaped, enclosing the nut by $\frac{1}{4}$ or less -----
----- 3a. *Q. shumardii* var. *shumardii*
1. Acorn cup rounded, enclosing the nut by $\frac{1}{3}$ or more -----
----- 3b. *Q. shumardii* var. *schneckii*

- 3a. *Quercus shumardii* Buckl. var. *shumardii* Figs. 67a-c, 68d.
Quercus shumardii Buckl. var. *acerifolia* Palmer, Jour. Arn.
 Arb. 8:54. 1927.

Acorn cup saucer-shaped, enclosing the nut by $\frac{1}{4}$ or less.



COMMON NAME: Shumard's Oak.

HABITAT: Low or alluvial woods; occasionally on drier sites.

RANGE: Maryland to southern Iowa, south to south-eastern Kansas, eastern Oklahoma and Texas, east to Florida.

ILLINOIS DISTRIBUTION: Occasional to common in the southern one-third of the state; also McLean County.

This is the typical form of the species. It was named for B. F. Shumard, former state geologist of Texas. Both varieties of *Q. shumardii* seem to bear a relationship to *Q. rubra*. They are distinguished from the latter by their gray, glabrous buds and generally deeper cut lobes of the leaves. These two species are not distinguished by the lumber industry. The wood is durable and strong. Its uses include interior finishing and furniture manufacturing.

Flowers appear in April and remain through May.

- 3b. *Quercus shumardii* Buckl. var. *schneckii* (Britt.) Sarg. Bot.
 Gaz. 65:425. 1918. Fig. 68e.
Quercus schneckii Britt. in Rydb. Bull. N.Y. Bot. Gard. 2:230.
 1901.

Acorns enclosed $\frac{1}{3}$ to $\frac{1}{2}$ by the rounded cup.



COMMON NAME: Schneck's Red Oak.

HABITAT: Dry, rocky uplands.

RANGE: Same as typical variety.

ILLINOIS DISTRIBUTION: Occasional in the southern one-third of the state.

I have seen intermediates between the varieties described here. It may be that what is given here as key differences will turn out to be part of the natural variation of the population system that is *Q. shumardii*. My suspicion is, however, that the differences may relate to environmental preference.

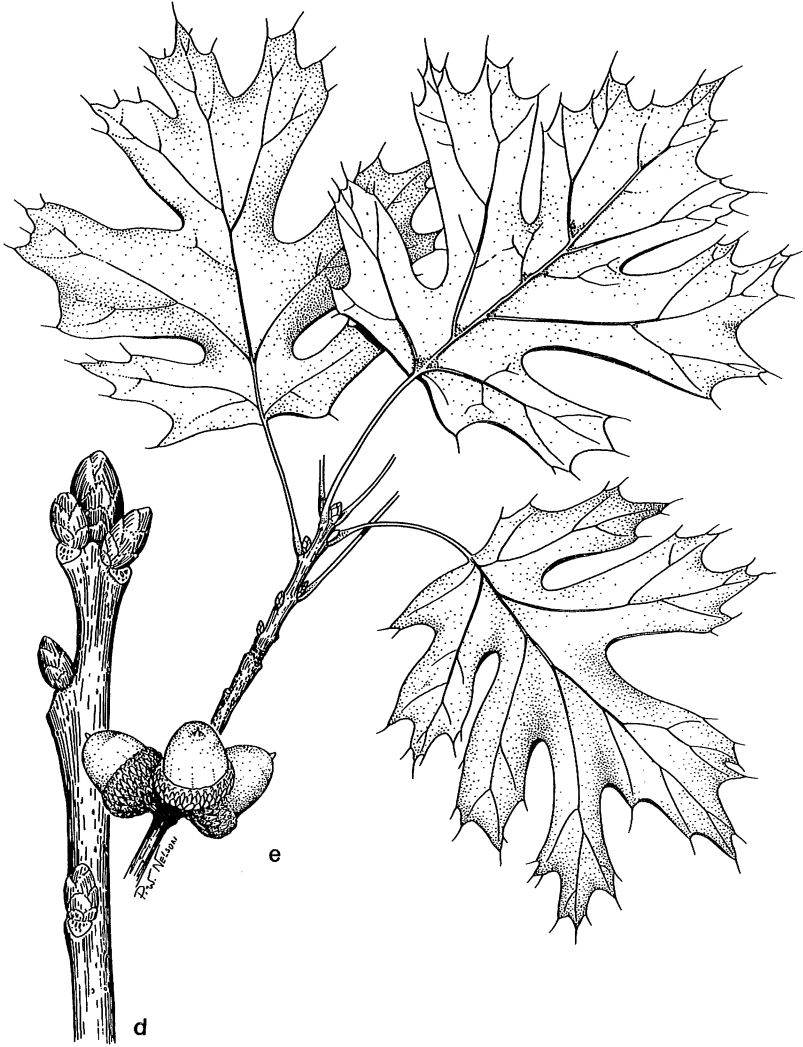
Until there are appropriate studies to the contrary, I prefer to maintain the varieties.



67. *Quercus shumardii* (Shumard's Oak). a, b, c. Leaf variations, $\times 1$.

Hybrids of this species and other red oaks have not been reported for Illinois.

Flowers bloom from April to May.



68. *Quercus shumardii* (Shumard's Oak). *d.* Winter twig and buds, $\times 4$. var. *schneckii* (Schneck's Red Oak). *e.* Leafy branch with fruits, $\times 1$.

4. *Quercus rubra* L. Sp. Pl. 996. 1753. Figs. 69, 70.

Quercus rubra L. emend. Du Roi, Harbk. Baumz. Nordamer. 2:265. 1772.

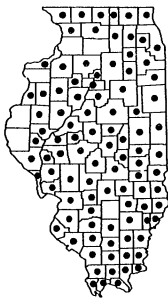
Quercus rubra maxima Marsh. Arb. Am. 122. 1785.

Quercus borealis Michx. f. N. Am. Sylva 1:98. 1817.

Quercus maxima (Marsh.) Ashe, Proc. Soc. Amer. Forest 11:90. 1916.

Quercus borealis Michx. var. *maxima* (Marsh.) Ashe, Proc. Soc. Amer. Forest 11:90. 1916.

Tree to 30 m tall, the trunk to 1.2 m in diameter, the bark shallowly divided into scaly plates on the upper limbs, gray and lustrous, becoming dark brown on older limbs and trunk; twigs slender, glabrous, reddish-brown; leaves obovate to oblong, acute or acuminate, 7- to 11-lobed, up to 23 cm long, up to 15 cm wide, the abaxial surface dull green, the abaxial paler green with tufts of fasciculate and multiradiate trichomes in primary vein axils; petioles stout, glabrous, up to 5 cm long; staminate inflorescence pubescent, up to 12 cm long; pistillate inflorescence 1- to 2-flowered on short, glabrous peduncles; fruit solitary or in pairs, sessile or nearly so, the nut to 4 cm long, up to 2 cm in diameter, enclosed $\frac{1}{4}$ or less by the cup.



COMMON NAME: Northern Red Oak.

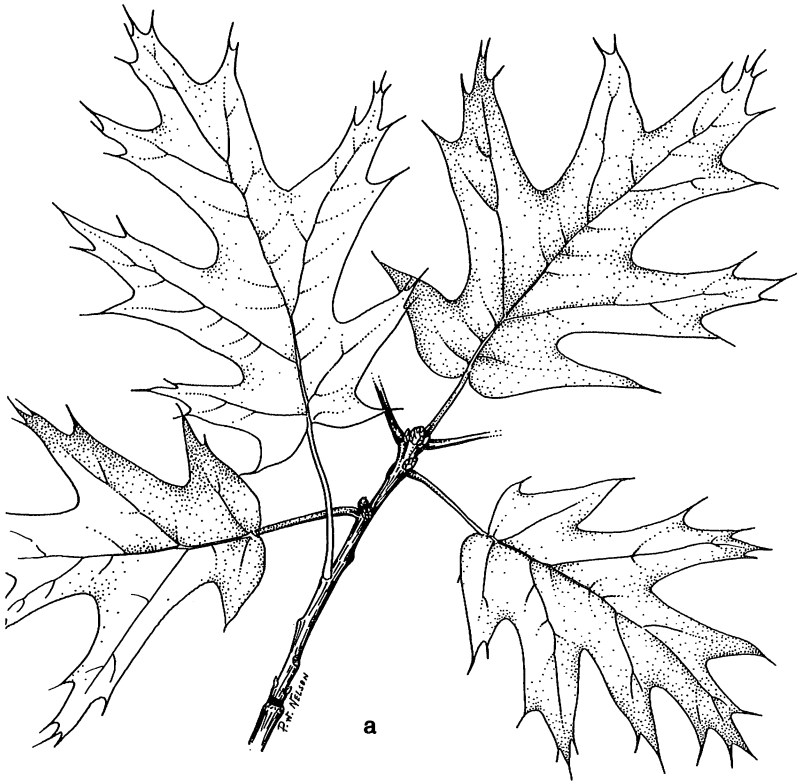
HABITAT: Upland woods, on well-drained slopes.

RANGE: New Brunswick to Ontario and Minnesota, south to eastern Kansas, east to Kentucky, eastern Tennessee, and northeastern Georgia.

ILLINOIS DISTRIBUTION: Throughout the state; doubtless in every county.

Quercus rubra is recognized by its large acorns with shallow cups. Although its leaves are somewhat variable in degree of lobing, they are typically more shallowly lobed than those of other oaks with lobed leaves.

Historically, the application of *Quercus rubra* has undergone several interpretations. Linnaeus provided the binomial, but Sargent (1918) concluded from a study of the type material that *Q. rubra* had been based not only upon the northern red oak, but also on specimens of Spanish oak of the southeastern states. To compound matters, Du Roi applied *Q. falcata* to the southern species and François Michaux *Q. borealis* to the northern species. Sargent's treatment left *Q. rubra* for the Spanish oak and *Q. borealis* for the



69. *Quercus rubra* (Northern Red Oak). a. Leafy branch, $\times 1$.

northern red oak. Thus, *Q. rubra* has been applied to both the northern red oak and the Spanish oak.

The International Code of Botanical Nomenclature provides for rejection of a name if it becomes a permanent source of confusion. Since the work by Trelease, this confusion has not persisted. He treated the Spanish oak as *Q. falcata* and authors of floras have followed his initiative.

Trelease did not use *Q. rubra* for any species. He considered the northern oak to be two species that he referred to as *Q. borealis* and *Q. maxima*, with *Q. rubra* a synonym for *Q. borealis*.

Palmer's 1942 study of the red oak complex did not find any basis for maintaining two species. He reduced the former species to a variety under *Q. borealis*.



70. *Quercus rubra* (Northern Red Oak). *b.* Winter twig and buds, $\times 4$. *c.* Staminate catkin, $\times 3$. *d.* Staminate flower, $\times 20$. *e.* Pistillate flowers, $\times 25$. *f.* Acorn, $\times 3$.

I have not accepted the concept that *Q. rubra* is composed of two varieties. Those who do base the distinction on appearance of the bark, diameter of the acorn cup, and its degree of inclusion of the nut. In a preliminary study of this problem by Jensen (1977), no basis for supporting two varieties could be found. While Jensen emphasizes that his results are not definitive, my observations of the same characters would tend to support his belief.

Quercus rubra is the red oak of the North American red oaks. The trees are given the common name because of the reddish appearance of their inner bark and older wood. The wood is hard and durable and is put to many uses, including interior finishing and furniture manufacturing. The trees transplant easily and are used in home landscape design and for street and park plantings.

Hybrids between this species and *Q. imbricaria* (*Q. X runcinata* [A. DC.] Engelm.) have been reported from the state, with the type being from bottomlands of the Mississippi River, opposite St. Louis.

The flowers bloom from April to May.

5. *Quercus velutina* Lam. Encycl. Meth. Bot. 1:721. 1785.

Tree 25–30 m tall, the trunk up to 1.2 m in diameter, the bark dark brown or black, yellowish within, deeply furrowed; twigs glabrous or hairy, stout; buds ovoid, strongly angled, gray-brown, hoary-tomentose, 0.5 to 1.5 cm long; leaves ovate to oblong, 7- to 9-lobed with deep or shallow sinuses, rarely tomentose throughout, 10–25 cm long, 6–20 cm wide, the abaxial surface tomentose or hairy only in primary vein axils, the trichomes multiradiate and stipitate-fasciculate; petioles stout, hairy or glabrous, up to 15 cm long; staminate inflorescence tomentose, up to 15 cm long; pistillate inflorescence 1- to 3-flowered on short tomentose peduncles; fruit sessile, in pairs or solitary, the nut ovoid or hemispheric, covered by soft pubescence, up to 2 cm long and broad, enclosed to ½ its length by a cup-shaped or turbinate cup that is softly pubescent.

Black oak leaves vary considerably in degree of lobing and pubescence. Trelease recognized several leaf forms that are not maintained here. Illinois black oaks may be divided into the following forms:

1. Twigs glabrous; abaxial leaf surface with hairs occurring mainly in primary vein axils ----- 5a. *Q. velutina* f. *velutina*
1. Twigs and abaxial leaf surface covered by a dense tomentum -----
----- 5b. *Q. velutina* f. *missouriensis*

5a. *Quercus velutina* Lam. f. *velutina* Figs. 71, 72.

Quercus discolor Ait. Hort. Kew. 3:358. 1789.

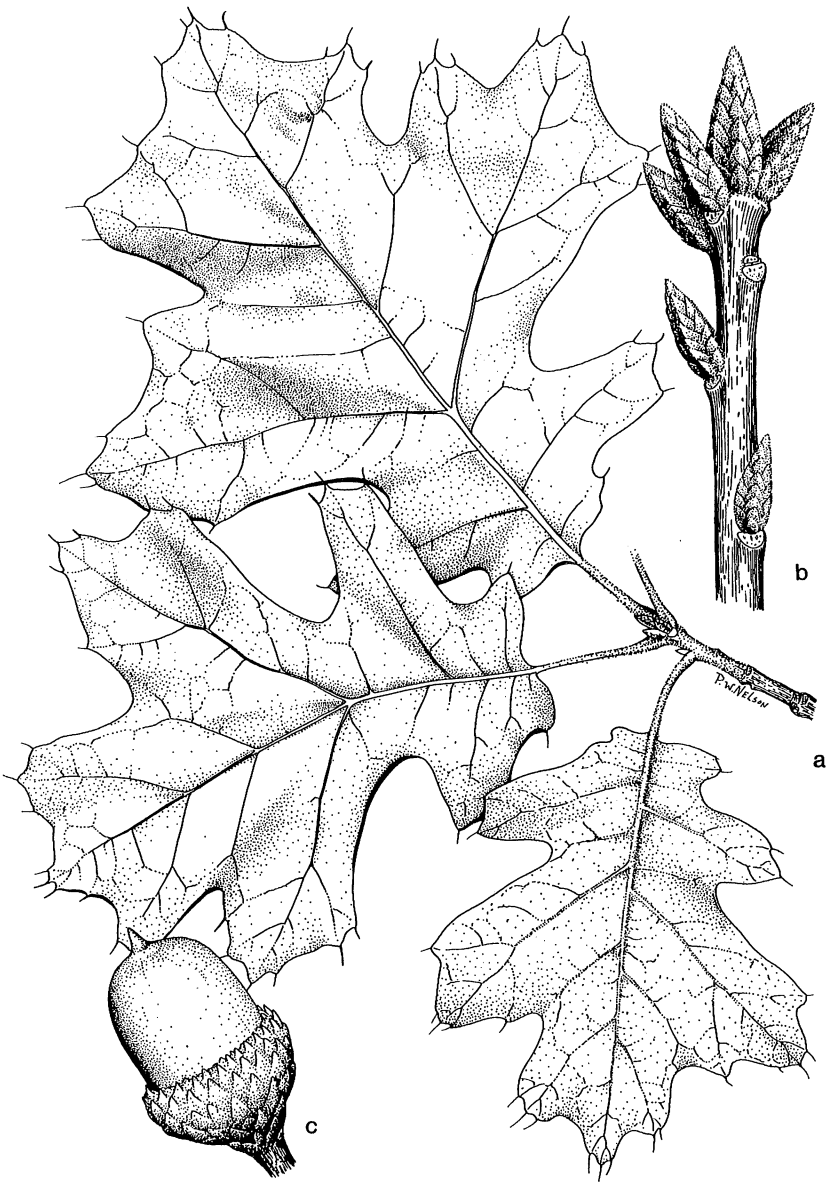
Quercus tinctoria Bartr. Travels 37. 1791, nomen only.

Quercus coccinea Muenchh. var. *tinctoria* (Bartr.) A. DC. in DC. Prodr. 16:61. 1864.

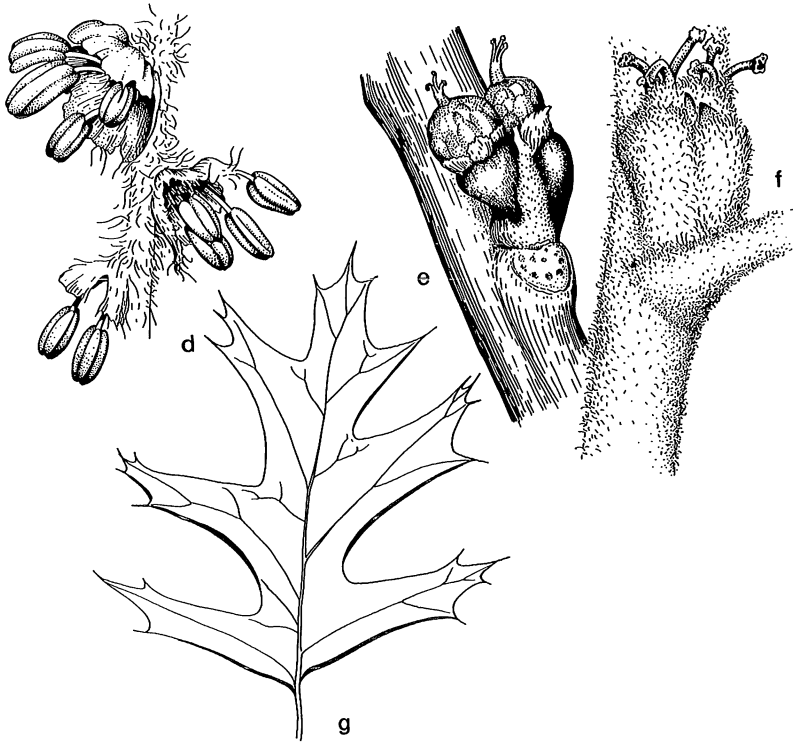
Quercus velutina Lam. f. *macrophylla* (Doppel) Trel. Mem. Nat. Acad. Sci. 20:14. 1924.

Quercus velutina Lam. f. *dilaniata* Trel. Mem. Nat. Acad. Sci. 20:14. 1924.

Quercus velutina Lam. f. *pagodaeformis* Trel. Mem. Nat. Acad. Sci. 20:14. 1924.



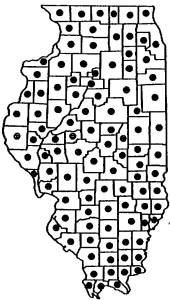
71. *Quercus velutina* (Black Oak). a. Leafy branch, $\times 1$. b. Winter twig and buds, $\times 5$. c. Acorn, $\times 4$.



72. *Quercus velutina* (Black Oak). d. Staminate flowers, $\times 20$. e. Young fruits, $\times 10$. f. Pistillate flowers, $\times 20$. g. Leaf variation, $\times 1$.

Quercus leiodermis Ashe Jour. Elisha Mitchell Sci. Soc. 40:43. 1924.

Twigs glabrous or nearly so; petioles glabrous; abaxial leaf surface with hairs mainly occurring in primary vein axils.



COMMON NAME: Black Oak.

HABITAT: Upland woods.

RANGE: Maine to southern Minnesota, south to eastern Texas, east to northern Florida.

ILLINOIS DISTRIBUTION: Throughout the state; in every county.

This is the typical form of black oak. Its leaf form is perhaps the most variable of the Illinois oaks. It can be recognized easily by its large, gray buds and yellow inner bark.

The wood of black oak is hard and durable and has been

used in general construction, for fuel, and for fence posts. It is not generally distinguished from wood of red oaks by the lumber industry. The yellow inner bark produces a substance called quercitron that is used as a dye in the textile industry. The bark also yields tannic acid used in the tanning process.

Hybrids between this species and *Q. imbricaria* (*Q. X leana* Nutt.), *Q. marilandica* (*Q. X bushii* Sarg.), and *Q. phellos* have been recorded in Illinois.

Flowers appear in April and remain until May.

5b. *Quercus velutina* Lam. f. *missouriensis* (Sarg.) Trel. Mem. Nat. Acad. Sci. 20:14. 1924 Not illustrated.

Quercus velutina Lam. var. *missouriensis* Sarg. Man. Trees N. Am. 239. 1905.

Quercus missouriensis (Sarg.) Ashe, Bull. Charleston Mus. 13:28. 1917.

Branchlets and lower surface of leaves permanently pubescent.



COMMON NAME: Missouri Black Oak.

HABITAT: Upland woods.

RANGE: Within the range of the typical form in Missouri, Arkansas, and Illinois.

ILLINOIS DISTRIBUTION: Known only from Saline and Union counties.

There seems to be little known about this form of the black oak. In the field it seems that it is more frequent on drier sites. It has been treated as a species, variety, or form and would appear to be in need of critical field studies to determine its taxonomic status.

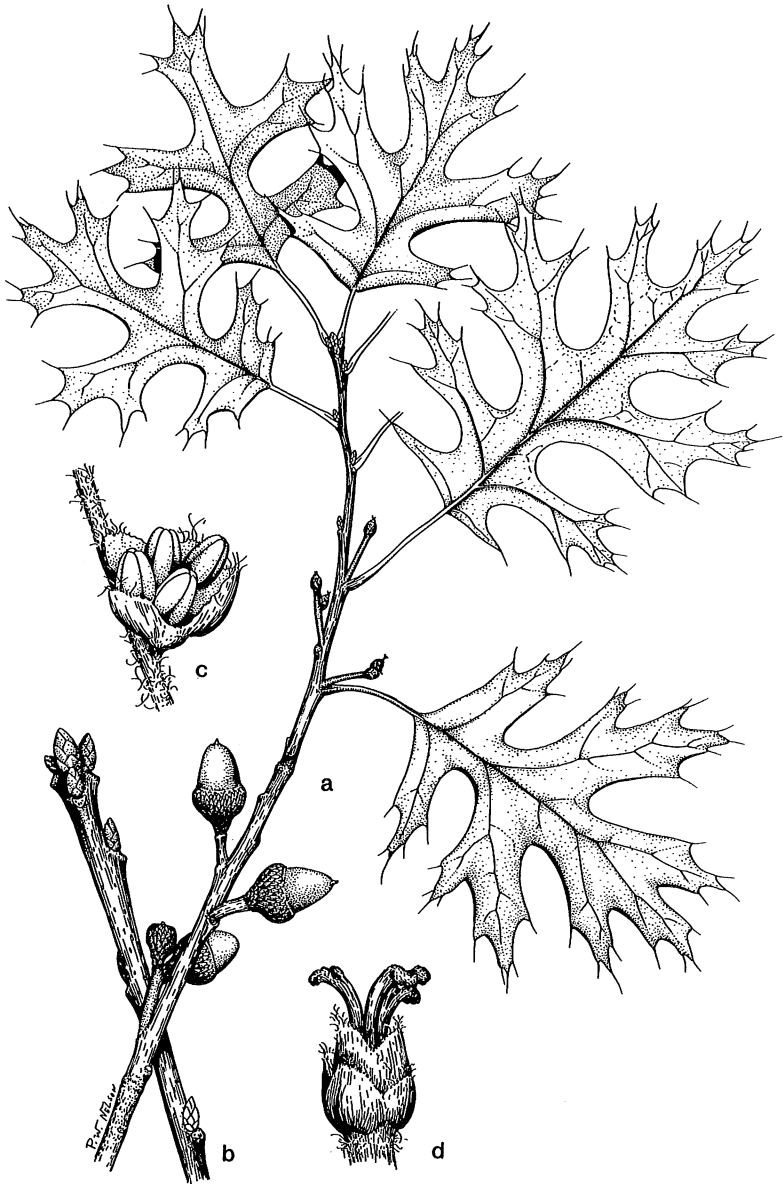
Flowers appear in April and remain until May.

6. *Quercus ellipsoidalis* E. J. Hill, Bot. Gaz. 27:204. 1899. Fig. 73.

Quercus ellipsoidalis E. J. Hill var. *coccinioides* Farwell, Amer. Midl. Nat. 12:120. 1930.

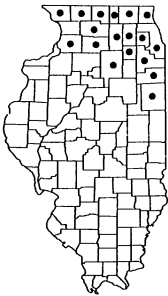
Quercus ellipsoidalis E. J. Hill var. *kaposianensis* J. W. Moore, Rhodora 52:56. 1950.

Tree to 25 m tall, the trunk up to 1 m in diameter, the bark shallowly fissured, gray-black on the surface, yellowish internally; twigs slender, gray-brown, glabrous; buds ovoid, acute or rounded, up to 0.7 cm long; leaves elliptic to obovate, the blade divided more than halfway to the midrib by 5–7 lobes, 8–16 cm long, 7–11 cm wide,



73. *Quercus ellipsoidalis* (Hill's Oak). *a.* Leafy branch, with fruits, $\times \frac{1}{2}$. *b.* Winter twig and buds $\times 3$. *c.* Staminate flower, $\times 20$. *d.* Pistillate flower, $\times 20$.

the abaxial surface pubescent only in primary vein axils, the trichomes fasciculate; petioles slender, glabrous, up to 6 cm in length; staminate inflorescence short, up to 5 cm in length, puberulent; pistillate inflorescence 1- to 3-flowered, peduncles stout, tomentose; fruit sessile or nearly so, solitary or in pairs, the nut reddish-brown, up to 2 cm long, up to 1 cm in diameter, enclosed $\frac{1}{3}$ – $\frac{1}{2}$ by the turbinate or cup-shaped cup.



COMMON NAME: Hill's Oak.

HABITAT: Dry upland woods.

RANGE: Northwestern Ohio to southeastern Minnesota, south to eastern Iowa and northern Missouri, east to north-central Illinois and Indiana.

ILLINOIS DISTRIBUTION: Predominantly in the north-eastern counties of the state.

Hill's oak resembles pin oak in leaf form, but may be distinguished from it by its more elongate acorns and preference for drier sites. On upland it is often found with black oak.

These may be distinguished by the difference in bud length (0.4–0.7 cm for Hill's oak; 0.6–1.2 cm for black oak) and acorn cup structure (the upper scales of black oak are loosely overlapping while those of Hill's oak are tightly appressed) (Steyermark, 1963).

The wood of Hill's oak is weak and unsuited to use for many of the purposes mentioned here for other oak species. Its leaves turn a brilliant red in autumn, but it is rarely used as an ornamental. This may be due to the tendency of lower branches to remain attached after dying so that the trees have an unkempt appearance.

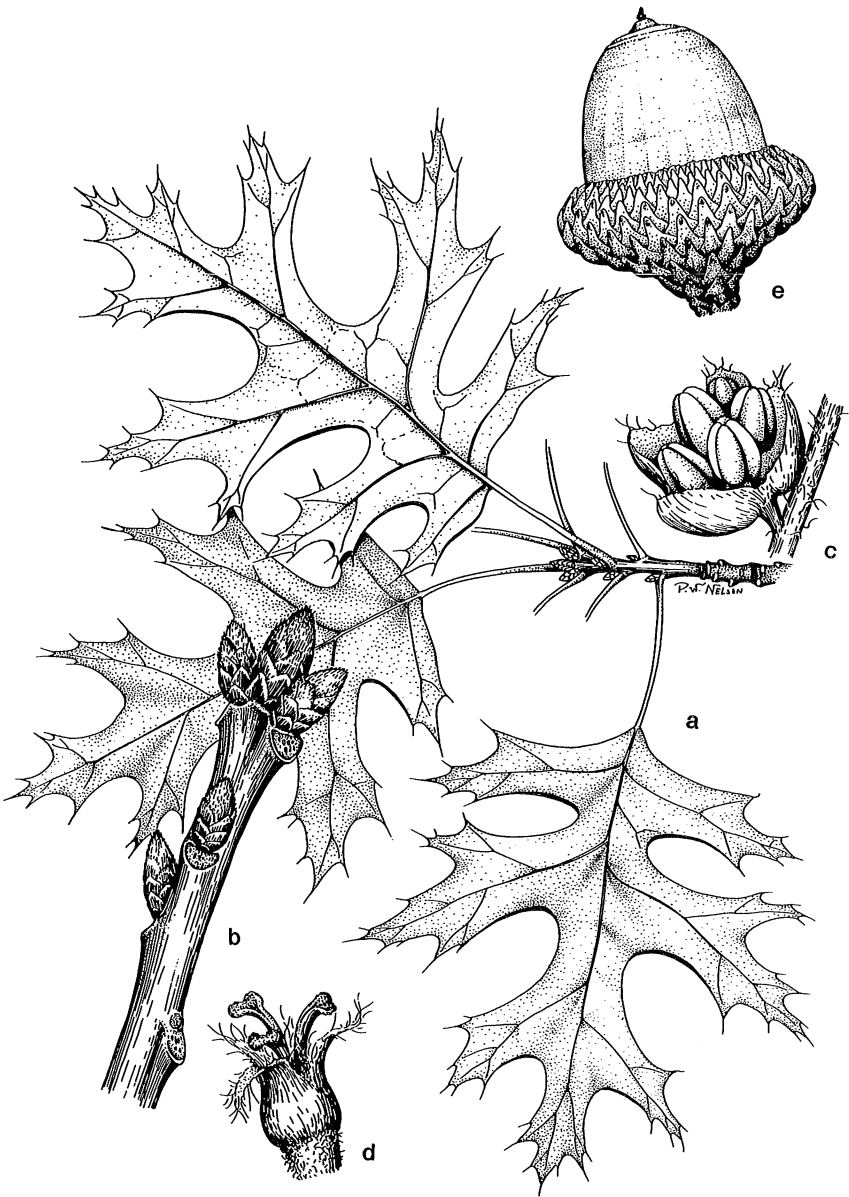
The type for *Q. ellipsoidalis* was collected by Rev. E. J. Hill near Chicago.

Hybrids between this species and *Q. velutina* (*Q. X paleolithicola* Trel.) have been recorded in Wisconsin, Iowa, and Indiana, but not from Illinois.

Flowers appear in April and May.

7. *Quercus coccinea* Muenchh. Hausvater 5:254. 1770. Fig. 74.
Quercus coccinea Muenchh. var. *tuberculata* Sarg. Bot. Gaz. 65:426. 1918.

Tree 20–25 m tall, the trunk up to 1.0 m in diameter, the crown narrowly spread, bark thin, reddish-brown, shallowly fissured; twigs ovoid, acute, up to 0.5 cm long; leaves elliptic to oblong-



74. *Quercus coccinea* (Scarlet Oak). a. Leafy branch, $\times 1$. b. Winter twig and buds, $\times 4$. c. Staminate flower, $\times 20$. d. Pistillate flower, $\times 20$. e. Acorn, $\times 4$.

obovate, lamina divided more than halfway to the midrib into 5–7 lobes, 7–15 cm long, 6–10 cm broad, the abaxial surface nearly glabrous or with tufts of hairs in the primary vein axils, the trichomes fasciculate; petioles slender, glabrous, up to 8 cm long; staminate inflorescence slender, glabrous, up to 10 cm long; pistillate inflorescence 1- to 3-flowered, peduncles puberulent, up to 2 cm long; fruit solitary or in pairs, sessile or on peduncles up to 2 cm long, the nut ovoid or hemispheric, up to 2.5 cm long and 2 cm in diameter, often with concentric impressions at the stylar end, enclosed by a cup-shaped or turbinate cup $\frac{1}{3}$ to $\frac{1}{2}$ its length.



COMMON NAME: Scarlet Oak.

HABITAT: Dry upland woods.

RANGE: Maine to southern Ontario, south to Oklahoma, east to Georgia.

ILLINOIS DISTRIBUTION: Restricted to the southern tiers of counties.

Scarlet oak resembles Hill's oak in leaf shape and form, but may be distinguished by its reddish buds and inner bark. Acorns frequently are marked by circular impressions concentric about the style.

Scarlet oak is well named, for its leaves are a brilliant reddish-orange in the fall. The trees transplant with some difficulty, but are becoming more frequent among the stock of nurserymen. The tree in my front yard is thriving after five years in the prairie soil of western Missouri. Its delicate branchlets are graceful in the landscape, and my neighbors ask where I found such a colorful "pin oak."

The wood of scarlet oak is stronger and more wiry than other oaks and so has been used for manufacturing tool handles, wagon parts, barrel staves, and furniture.

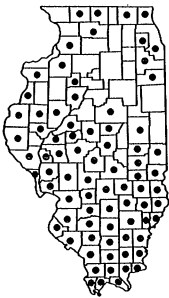
Hybrids between this species and other red oaks are not known from the state.

Flowers appear in April and May.

8. *Quercus palustris* Muenchh. Hausvater 5:253. 1770. Figs. 75, 76.

Tree up to 35 m in height, the trunk up to 1.5 m in diameter, the crown broadly pyramidal in younger, open grown trees, the lower branches pendulous, the upper branches ascending, becoming open and irregular in older trees; bark thin, gray-brown, scarcely

furrowed; twigs slender, tough and wiry, dark gray-brown, glabrous; leaves obovate, the blade divided more than halfway to the midrib, producing 5-7 lobes, 9-16 cm long, 5-12 cm broad, the abaxial surface with tufts of hair in the primary vein axils, the trichomes fasciculate and stellate; petioles slender, glabrous, up to 5 cm long; staminate inflorescence slender, pubescent, up to 8 cm long; pistillate inflorescence 1- to 3-flowered, tomentose, the flowers on short, hairy peduncles; fruit sessile or nearly so, solitary, in pairs, or in three's, the nut hemispheric, up to 1.5 cm in diameter, enclosed only at the base by the saucer-shaped cup.



COMMON NAME: Pin Oak.

HABITAT: Swampy woods and bottoms.

RANGE: Massachusetts to eastern Iowa, south to north-eastern Oklahoma, east to northern Virginia.

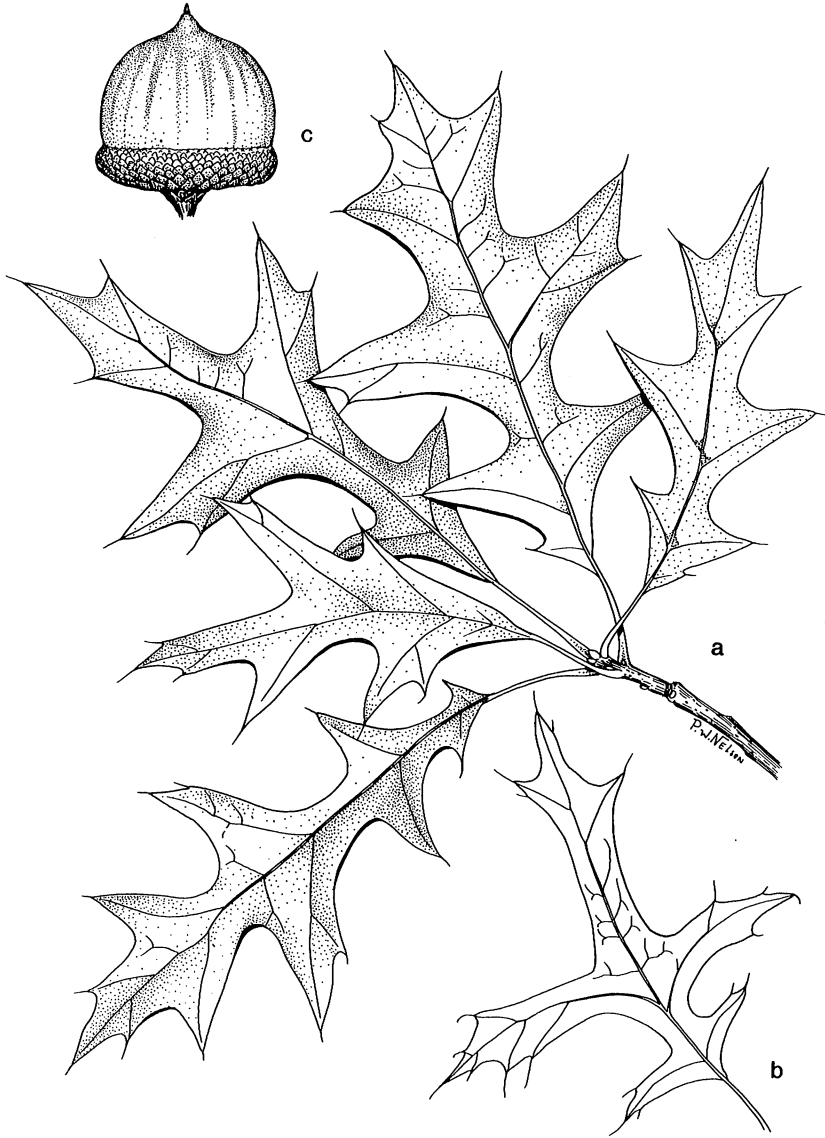
ILLINOIS DISTRIBUTION: More prevalent in the southern half of the state, but found also in the extreme northern counties.

Among those red oaks with lobed leaves, pin oak may be distinguished by its pendulous lower limbs that persist following death and by its small, nearly spherical acorns.

Pin oak is perhaps the most frequently planted oak in lawns, parks, and along streets in the eastern United States. This may be due to its graceful pyramidal lines, attractive autumn foliage, disease-hardiness, and ease of transplant. The branches produce short, sharply pointed spurs, thus accounting for the common name. This feature is also distinctive for the species.

The same prolific branching that accounts for its attractiveness also gives rise to knots in the wood, which is judged to be of poor quality by lumbermen. Pin oak is, however, used for pilings, for fuel, in general construction, and for shingles.

In southern Illinois, the trees are part of a management plan known as a "greentree reservoir." The reservoir is flooded during the dormant season and drained in the spring. Dormant-season flooding does not injure the trees as is the case in reservoirs permanently flooded. Pin oaks in greentree reservoirs produce abundant acorn crops and the sites, when coupled with impounded water, attract and support waterfowl for public hunting. The trees are cut during the summer on a rotational system and sold to produce revenue for support of the site. Pin oak is found in nearly pure



75. *Quercus palustris* (Pin Oak). a. Leafy branch, $\times 1$. b. Leaf variation, $\times 1$. c. Acorn, $\times 5$.



76. *Quercus palustris* (Pin Oak). *d.* Staminate flowers, $\times 20$. *e.* Winter twig and buds, $\times 4$. *f.* Twig with pistillate flowers, $\times 15$. *g.* Stipule, $\times 40$.

stands in the reservoirs and may attain densities of 250 trees per acre or more (Thomson and Anderson, 1976).

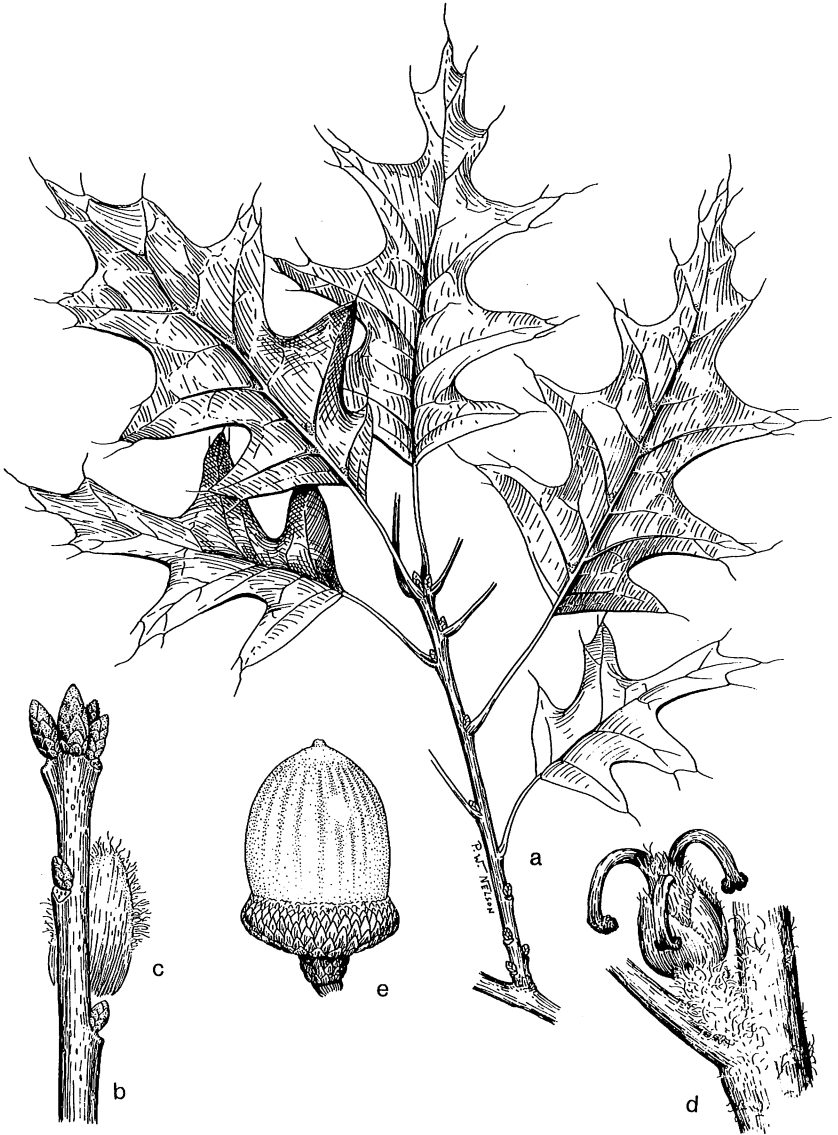
Hybrids between this species and *Q. imbricaria* (*Q. X exacta* Trel.) and *Q. phellos* (*Q. X schochiana* Dieck) have been reported from the state.

Flowers appear in April and May.

9. *Quercus nuttallii* Palmer, Jour. Arn. Arb. 8:52. 1927. Fig. 77. *Quercus nuttallii* Palmer var. *cachensis* Palmer, Jour. Arn. Arb. 18:136. 1937.

Quercus palustris Muenchh. f. *nuttallii* (Palmer) C. H. Muller, Am. Midl. Nat. 27:478. 1942.

Tree to 25 m tall, with a narrow pyramidal crown, the trunk up to 1 m in diameter; bark gray or slate-colored, shallowly fissured; twigs glabrous, gray or slate-colored, slender; buds ovoid, 0.4–0.6 cm long, reddish-brown, the upper scales ciliate; leaves obovate or elliptic, 8–16 cm long, 5–12 cm wide, the abaxial surface pubescent



77. *Quercus nuttalli* (Nuttall's Oak). a. Leafy branch, $\times 1$. b. Winter twig with buds, $\times 4$. c. Bud scale, $\times 20$. d. Pistillate flower, $\times 20$. e. Acorn, $\times 4$.

only in the primary vein axils, the trichomes multiradiate and fasciculate; petioles slender, up to 5 cm long; fruit sessile or nearly so, the nut short-cylindric or oblong-ovoid, often puberulent near the apex, 2.0–2.8 cm long, 1.2–2.0 cm in diameter.



COMMON NAME: Nuttall's Oak.

HABITAT: Low or swampy woods.

RANGE: Eastern Kentucky, southern Illinois, southeastern Missouri, southward in the Mississippi valley and eastern Texas.

ILLINOIS DISTRIBUTION: Extremely rare; known only from Alexander County.

Nuttall's oak was not distinguished until 1927 from other species of red oak. The trees had been used as a source of lumber in much the same way as pin oak, red oak, and Spanish oak. In general habit, the trees most closely resemble pin oak. Also, the leaves are more like those of pin oak than other red oak species. The fruit, however, is very different. The nut is larger and the base of the cup is stipitate.

Hybrids between this species and other red oaks have not been reported.

Flowers appear in April and remain until May.

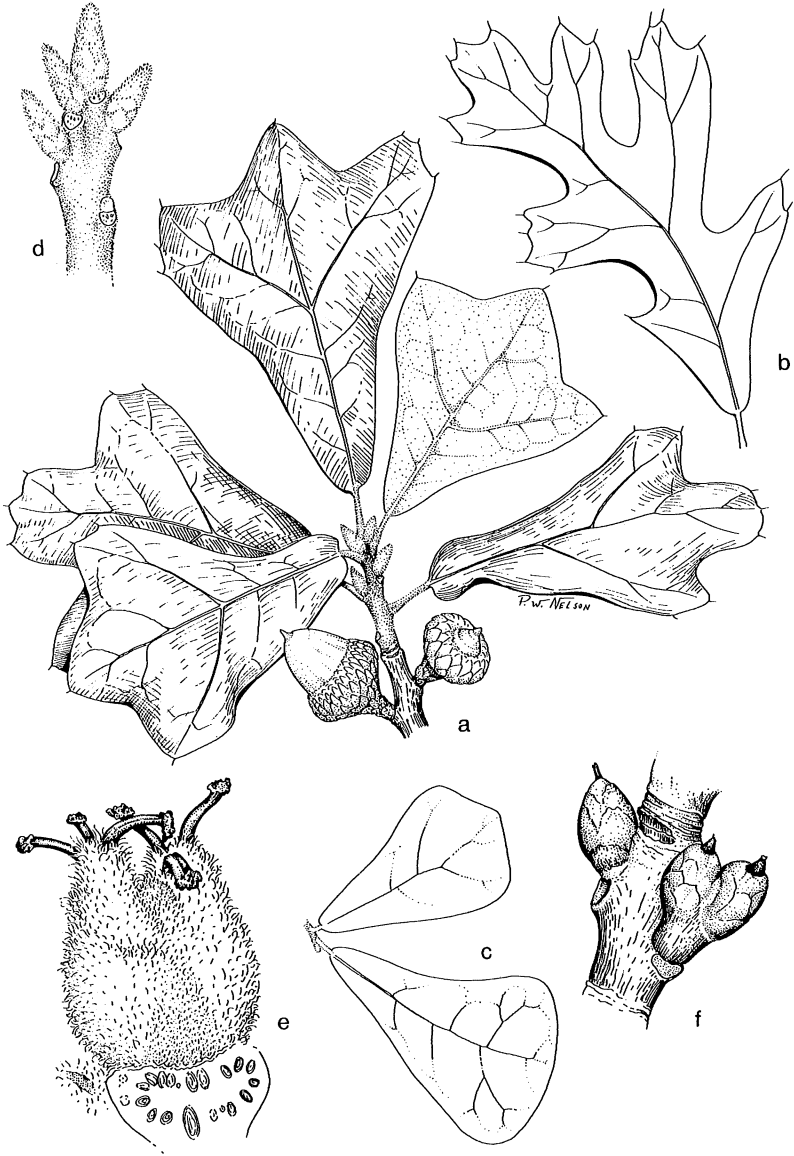
10. *Quercus marilandica* Muenchh. Hausvater 5:253. 1770.
Fig. 78.

Quercus ferruginea Michx. f. Hist. Arb. Am. Sept. 2:92, t. 18.
1812.

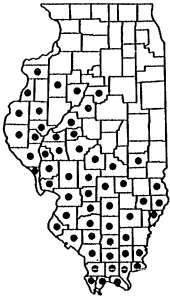
Quercus marilandica var. *ashei* Sudw. Jour. Forestry 20:167.
1922.

Quercus neo-ashei Bush, Bull. Torrey Club 55:248. 1928.

Tree to 15 m tall, crown rounded, trunk up to 1 m in diameter; bark dark brown or black, deeply divided into squarish plates; twigs stout, light brown, pubescent; buds ovoid, angular, reddish-brown, covered by a rusty pubescence; leaves broadly obovate, shallowly 3-lobed near the apex or entire, 15–18 cm long, 12–16 cm broad, the abaxial surface hairy, the trichomes multiradiate and fasciculate; petioles stout, up to 2 cm long; staminate inflorescence hoary, up to 10 cm long; pistillate inflorescence 1- to 3-flowered, on short, stout, hairy peduncles; fruit solitary or in pairs, sessile, or on peduncles up to 2 cm long, the nut oblong, up to 2 cm long, up to 1.5 cm in diameter, enclosed up to 2/3 its length by the cup.



78. *Quercus marilandica* (Blackjack Oak). a. Leafy branch with acorns, $\times 1$. b. Leaf variation, $\times 1$. c. Leaf variations, $\times 1\frac{1}{2}$. d. Winter twig with buds, $\times 4$. e. Pistillate flowers, $\times 20$. f. Twig with developing fruits, $\times 6$.



COMMON NAME: Blackjack Oak.

HABITAT: On poor soils, especially on dry, rocky uplands.

RANGE: New York to southern Iowa and southeastern Nebraska, south to eastern Texas, east to northern Florida.

ILLINOIS DISTRIBUTION: Occurs in the southern two-thirds of the state.

Blackjack oak is recognized easily by its broadly ovate leaves that may be 3-lobed or entire near the apex.

This species has not enjoyed the recognition afforded its more stately counterparts among the red oaks. It is a small to medium-sized tree with an often scraggly appearance. Lumbermen do not judge its wood to be of high quality, but it has been a source for fuel and fence posts.

In Illinois, the trees' presence is regarded as an indication of nutrient-poor soils. Many abandoned farms, whose soil lies fallow, will still support this rugged pioneer.

Hybrids between this species and *Q. imbricaria* (*Q. X tridentata* [A. DC.] Engelm.) and *Q. velutina* (*Q. X bushii* Sarg.) have been reported from the state.

Flowers bloom from April to May.

11. *Quercus falcata* Michx. Hist. Chenes Am. Sept., *Quercus* No. 16, pl. 28. 1801. Fig. 79.

Quercus rubra L. Sp. Pl. 996. 1753, *pro parte*.

Quercus nigra L. var. *digitata* Marsh. Arb. Am. 121. 1785.

Quercus triloba Michx., Hist. Chenes Amer. Sept., *Quercus* No. 14, pl. 26. 1801.

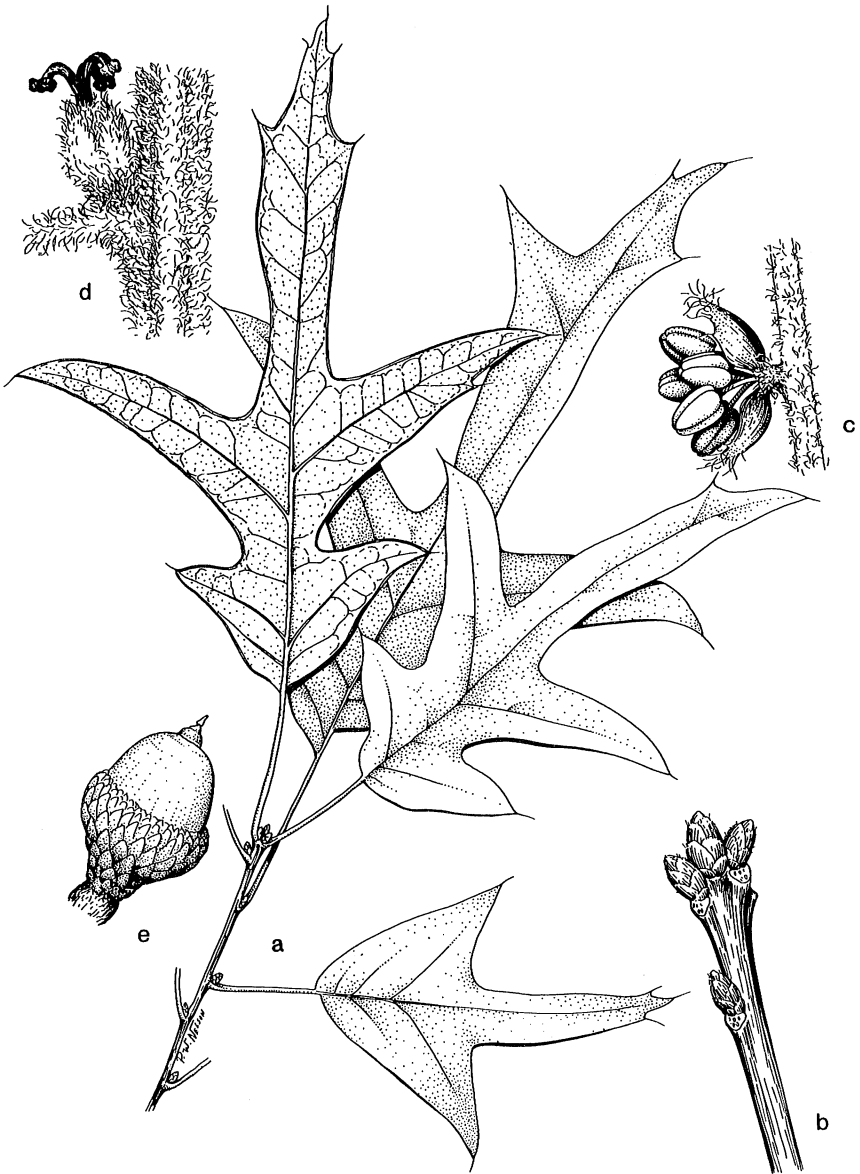
Quercus elongata Willd. in Muhl. & Willd. Gesell. Naturf. Freunde Berlin Neue Schr. 3:400. 1801.

Quercus falcata Michx. var. *triloba* (Michx.) Nutt. Gen. N. Am. Pl. 2:214. 1818.

Quercus digitata (Marsh.) Sudw. Gard. & Forest 5:99. 1892.

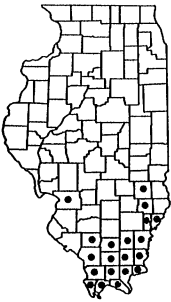
Quercus rubra L. var. *triloba* (Michx.) Ashe, Proc. Soc. Amer. Foresters 11:90. 1916.

Tree to 30 m tall, to 1.2 m in diameter, the crown broadly spreading, rounded; bark smooth or shallowly furrowed, dark brown; twigs gray and hairy, becoming reddish brown and smooth, stout; buds ovoid, acute, reddish brown, pubescent, up to 0.6 cm long;



79. *Quercus falcata* (Spanish Oak). *a.* Leafy branch, $\times 1$. *b.* Winter twig with buds, $\times 4$. *c.* Staminate flower, $\times 20$. *d.* Pistillate flower, $\times 15$. *e.* Acorn, $\times 3$.

leaves ovate to obovate, with 1-3 pairs of deeply cut lobes, the lobes often falcate, 15.0-17.5 cm long, 10.0-12.5 cm broad, pubescent on the lower surface with reddish or whitish hairs, the trichomes fasciculate and multiradiate; petioles slender, pubescent, up to 6 cm long; staminate inflorescence 7.5-15.0 cm long, pendulous, pubescent; pistillate inflorescence 1- to 3-flowered, contracted, rusty pubescent, 2.0-3.5 cm long; fruit sessile, or on tomentose peduncles 1-3 cm long, solitary or in pairs, the nut spherical or ellipsoid, up to 2 cm long, up to 1.5 cm broad, orange-brown, enclosed to $\frac{1}{3}$ its length by the reddish brown, pubescent cup.



COMMON NAME: Spanish Oak.

HABITAT: Dry upland woods, especially on poor soils; occasionally in bottomlands.

RANGE: New Jersey to central Missouri, south to eastern Texas, east to northern Florida.

ILLINOIS DISTRIBUTION: Found in the southern one-third of the state.

Spanish oak has been discussed also under *Q. rubra* for nomenclatural reasons. The interested reader is referred to that interpretation. The list of synonymy reflects the degree of consideration its features have

undergone.

There is considerable controversy over the distinction between this oak and *Q. pagoda* at the species level. Current opinion seems to indicate both oaks to be valid species, a view followed here.

The wood of Spanish oak is heavy, hard, strong, coarse-grained, and reddish brown. Its uses include fence posts, fuel, and general construction.

Hybrids between this species and *Q. imbricaria* (*Q. X anceps* E. J. Palmer) and *Q. phellos* (*Q. X ludoviciana* Sarg.) have been reported for the state.

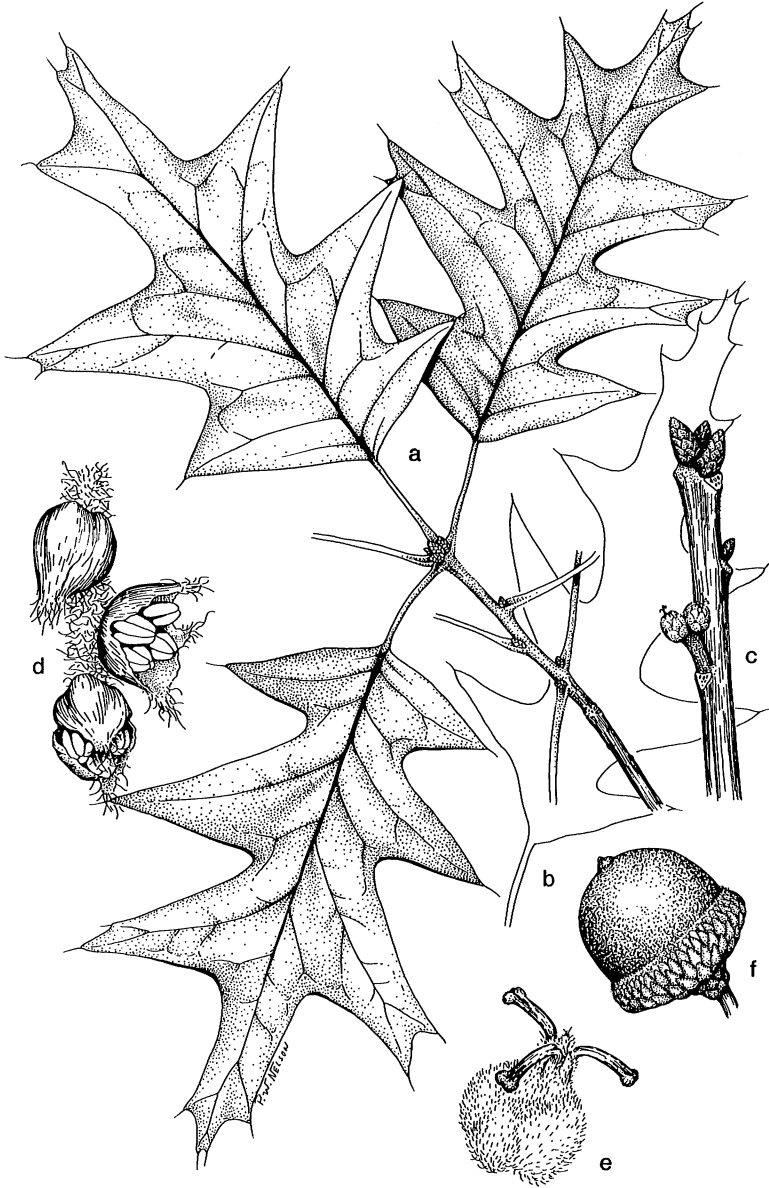
Flowers bloom in April and May.

12. *Quercus pagoda* Raf. Alsogr. Am. 23. 1838. Fig. 80.

Quercus falcata Michx. var. *pagodaefolia* Ell. Sketch Bot. S.C. & Ga. 2:605. 1824.

Quercus pagodaefolia (Ell.) Ashe, Bot. Gaz. 24:375. 1897.

Quercus rubra L. var. *pagodaefolia* (Ell.) Ashe, Proc. Soc. Am. Foresters 11:90. 1916.



80. *Quercus pagoda* (Cherrybark Oak). a. Leafy branch, $\times 1$. b. Leaf variation, $\times 1$. c. Winter twig and buds, $\times 4$. d. Staminate flowers, $\times 15$. e. Pistillate flower, $\times 20$. f. Acorn, $\times 3$.

Quercus rubra L. var. *leucophylla* Ashe, Bull. Charleston Mus. 13:25. 1917.

Quercus leucophylla (Ashe) Ashe, Torreyia 18:73. 1918.

Quercus rubra L. var. *pagodaefolia* (Ell.) Ashe ex Sarg. Bot. Gaz. 65:427. 1918.

Quercus pagoda Raf. var. *leucophylla* (Ashe) Ashe, Jour. Elisha Mitchell Sci. Soc. 34:136. 1918.

Quercus pagoda leucophylla (Ashe) Ashe ex Trel. Mem. Natl. Acad. Sci. 20:202. 1924.

Quercus falcata Michx. var. *leucophylla* (Ashe) Palmer & Steyer-erm. Ann. Mo. Bot. Gard. 22:518. 1935.

Tree to 35 m tall, to 2.5 m in diameter, the crown broadly rounded; bark fissured into narrow ridges with small scales; twigs gray, usually pubescent at first, becoming glabrous; buds ovoid, acute, reddish brown, up to 0.6 mm long; leaves oval to oblong, with 5–7 lobes, the lobes slightly or not at all falcate, 12–25 cm long, 10–15 cm broad, pubescent below, the trichomes fasciculate and multi-radiate; petioles slender, pubescent, up to 7.5 cm long; staminate inflorescence 7.5–15.0 cm long, pendulous, pubescent; pistillate inflorescence 1- to 3-flowered, contracted, rusty pubescent, 2.0–3.5 cm long; fruit short-pedunculate, solitary or in pairs, the nut short-subglobose, up to 2 cm long, up to 1.5 cm broad, brown, enclosed to ½ its length by the reddish brown, pubescent cup.



COMMON NAME: Cherrybark Oak.

HABITAT: Bottomlands and river banks.

RANGE: Southeastern Virginia to southeastern Missouri, south to Texas, east to Florida.

ILLINOIS DISTRIBUTION: Found only in the southernmost part of the state.

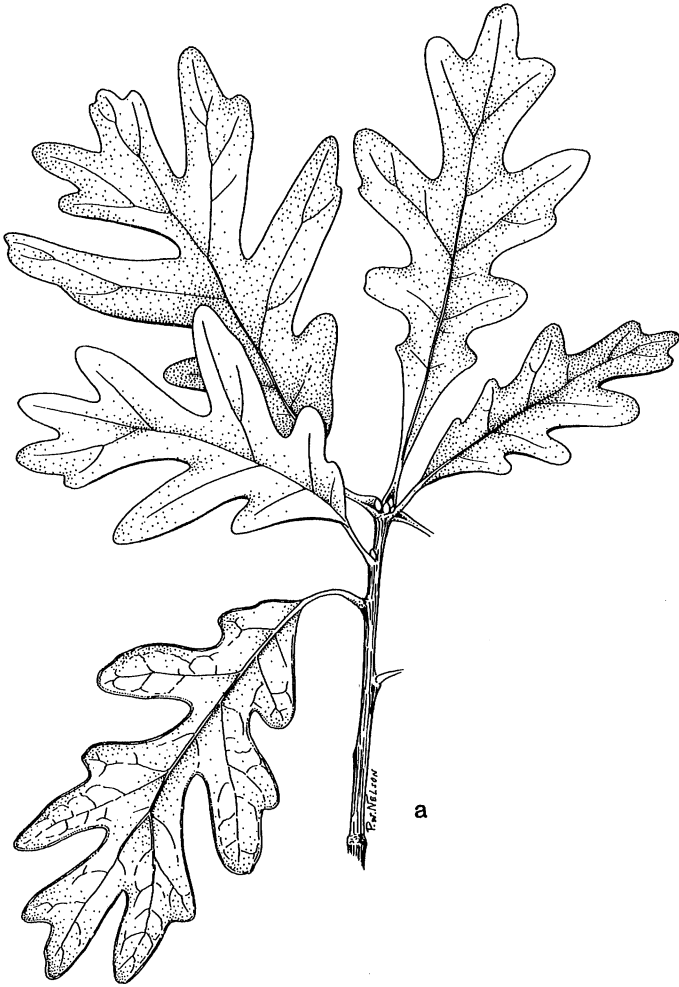
Cherrybark oak derives its common name from its scaly bark, which has a reddish tinge like that of a cherry tree. It grows within the range of *Q. falcata*, but is found on wetter soils.

Its wood is considered more valuable than that of *Q. falcata* as it is harder, heavier, and stronger. It has been used for interior finishing, furniture construction, and cabinets.

Flowers bloom in April and May.

13. *Quercus alba* L. Sp. Pl. 996. 1753. Figs. 81, 82.

Quercus alba L. var. *repanda* Michx. f. Hist. Chenes Amer. Sept., *Quercus* No. 4, pl. 5, fig. 2. 1801.

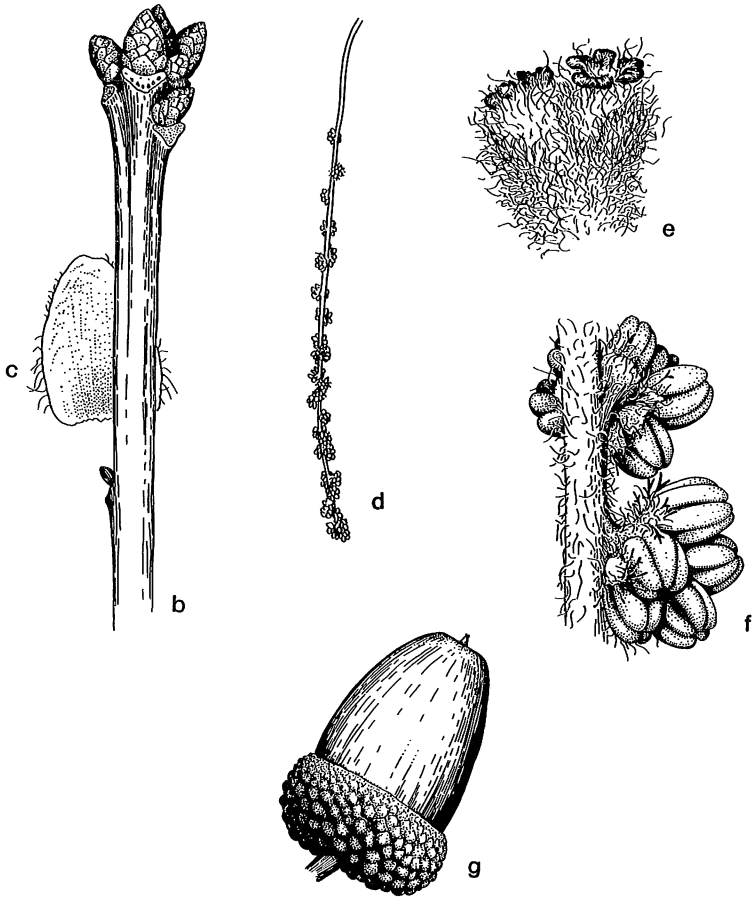


81. *Quercus alba* (White Oak). a. Leafy branch, $\times 1$.

Quercus alba L. var. *pinnatifida* Michx. f. Hist. Chenes Amer. Sept., *Quercus* No. 4, pl. 5. 1801.

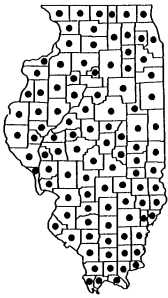
Quercus alba L. var. *latiloba* Sarg. Bot. Gaz. 65:438. 1918.

Tree to 30 m tall, to 1.5 m in diameter, the crown round-topped; bark light gray, flaky at maturity; twigs red-brown, slender, glabrous; buds ovoid, red-brown, glabrous, to 0.5 cm long; leaves oblong-obovate, lobed to $\frac{1}{2}$ the blade width with 2–5 pairs of ascending lobes, to 20 cm long, to 12 cm wide, the abaxial surface of young



82. *Quercus alba* (White Oak). *b.* Winter twig and buds, $\times 4$. *c.* Bud scale, $\times 20$. *d.* Staminate inflorescence, $\times 3$. *e.* Staminate flowers, $\times 20$. *f.* Pistillate flowers, $\times 20$. *g.* Acorn, $\times 4$.

leaves with fasciculate trichomes, the mature leaves glabrous; petioles glabrous, up to 2.5 cm long; staminate inflorescence 5–8 cm long; pistillate inflorescence a contracted spike with one to three flowers; fruit sessile or attached to a peduncle 1–5 cm in length, the nut 1.5–3.0 cm long, 1.0–1.5 cm in diameter, greenish-brown at maturity, enclosed up to $\frac{1}{4}$ its length by a warty cup.



COMMON NAME: White Oak.

HABITAT: Upland woods.

RANGE: Maine to southern Ontario, south to eastern Texas, east to northern Florida.

ILLINOIS DISTRIBUTION: Common throughout the state; in every county.

Quercus alba is distinguished from all other white oaks by its pinnately lobed leaves that are glabrous at maturity.

White oak is the state tree of Illinois. It is a frequent component of rich uplands. The bark is light gray or occasionally white, flaky, and divided into flat broad plates and shallow fissures.

White oak is sought for its lumber qualities. The wood is hard, tough, and very durable. It is used for interior finishing, furniture manufacturing, and burning for home heating. It is also rived into long, narrow strips and woven into baskets by craftsmen. The wood is filled with tyloses and is impervious. It is, therefore, of value in barrel-making and used especially by the fermentation industry.

Acorns of white oak may be ground into meal in preparation of acorn bread. The acorns, however, require boiling to remove bitter-tasting tannins.

Hybrids between this species and *Q. bicolor* (*Q. X jackiana* Schneider), *Q. macrocarpa* (*Q. X bebbiana* Schneider), *Q. prinoides* (*Q. X faxonii* Trel.), and *Q. stellata* (*Q. X fernowi* Trel.) have been reported from the state.

Flowers bloom from April to May.

14. *Quercus prinoides* Willd. in Muhl. & Willd. var. *acuminata* (Michx.) Gl. Phytologia 4:23. 1952. Figs. 83, 84.

Quercus castanea Willd. in Muhl. & Willd. Gesell. Naturf. Freunde Berlin Neue Schr. 3:397. 1801.

Quercus prinus var. *acuminata* Michx. Hist. Chenes Amer. Sept., *Quercus* No. 5, pl. 8. 1801.

Quercus muehlenbergii Engelm. Trans. Acad. Sci. St. Louis 3:391. 1877.

Quercus acuminata (Michx.) Sarg. Gard. & For. 8:93. 1895.

Quercus alexanderi Britton, Man. Fl. North. States & Canada 336. 1901.

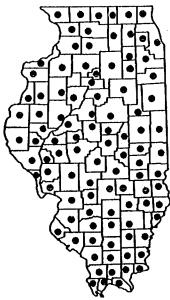
Quercus brayi Small, Bull. Torrey Club 28:358. 1901.

Quercus acuminata Michx. var. *alexanderi* (Britton) Farwell, Rept. Mich. Acad. Sci. 6:206. 1904.

Quercus muehlenbergii Engelm. var. *brayi* (Small) Sarg. Bot. Gaz. 65:442. 1918.

Quercus muehlenbergii var. *alexanderi* (Britton) Farwell, Papers Mich. Acad. Sci., Arts and Letters 3:93. 1924.

Tree to 30 m tall, the trunk to 1.5 m in diameter, the crown rounded; bark light gray, flaky; twigs light brown, glabrous, slender, easily broken; buds smooth, dark brown, rounded or pointed, 0.2–0.5 cm long; leaves oblong-lanceolate or obovate, pointed at the tip, rounded or narrowed at the base, serrate or coarsely toothed, the teeth mucronate and varying from 6–14 pairs per leaf, the blade 10–18 cm long, 5–9 cm wide, the abaxial surface finely pubescent, the trichomes stellate; petioles thin, yellowish, glabrous, 1.0–3.5 cm long; staminate inflorescence 3.5–15.0 cm long, drooping; pistillate inflorescence 1- to 3-flowered; fruit solitary or in pairs, sessile or nearly so, the nut ovoid, brown, 1.5–2.0 cm long, 1.2–1.8 cm in diameter, enclosed $\frac{1}{3}$ to $\frac{1}{2}$ by the cup.



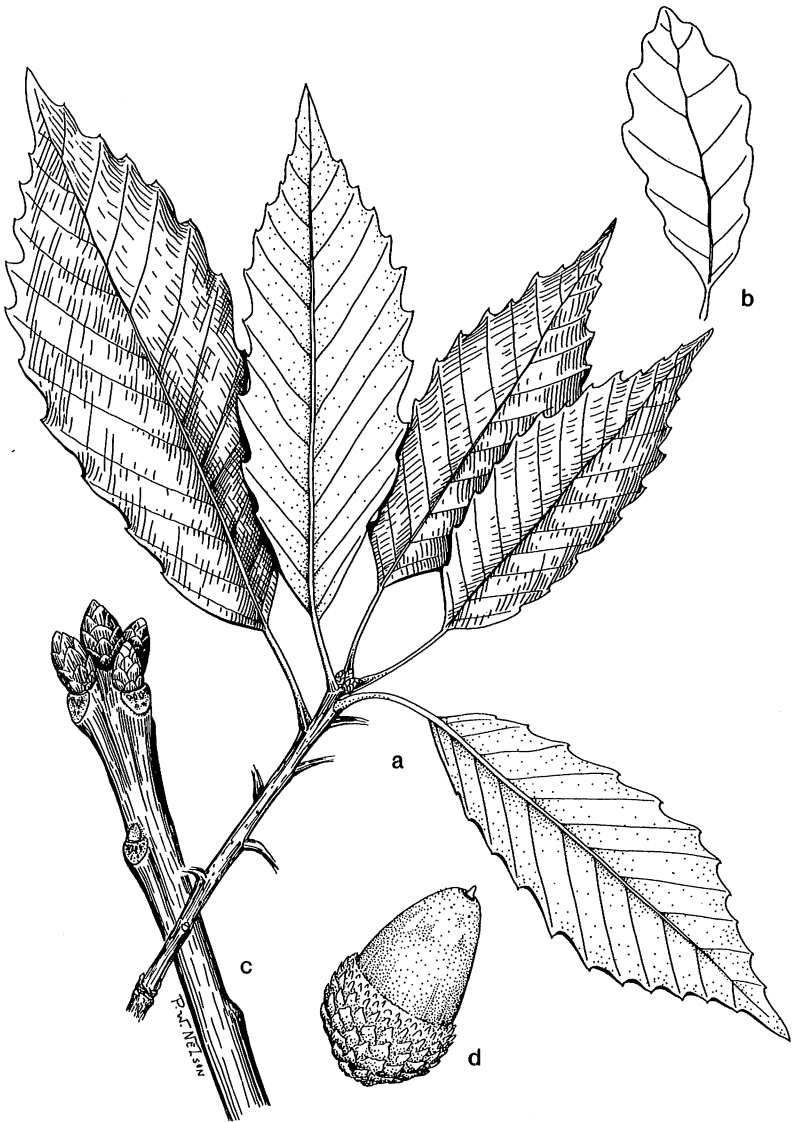
COMMON NAMES: Chinquapin Oak; Yellow Chestnut Oak.

HABITAT: Calcareous soils, especially on dry uplands, but also on low rich slopes.

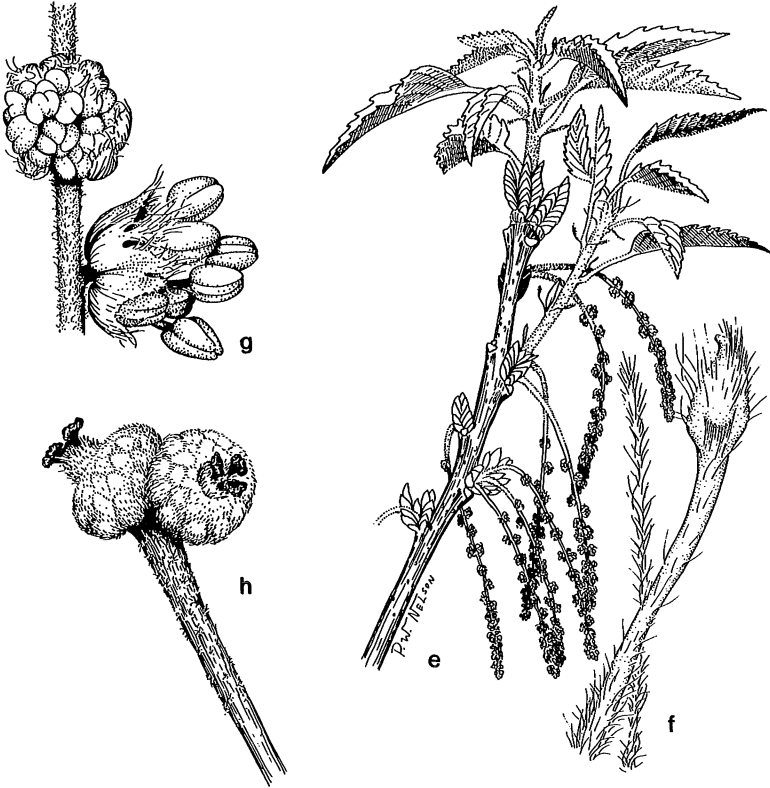
RANGE: Vermont to southern Minnesota, south to eastern Nebraska, Kansas, Oklahoma, and Texas, east to northern Florida. Also, widely disjunct populations are known from the Capitan Mountains of New Mexico, the Guadalupe Mountains of west Texas, and in the mountains of northern Mexico.

ILLINOIS DISTRIBUTION: Throughout the state; in every county.

Quercus prinoides, with all its variants, is a medium to large-sized tree throughout most of its range, but on the periphery it often assumes the habit of a shrub. It was to the shrub that Willdenow applied the binomial. Engelmann later used *Q. muehlenbergii* for the tree form. The two were maintained as distinct species until the work of Gleason (1952). He treated them as varieties of *Q. prinoides* (var. *prinoides* = *Q. prinoides* Willd.; var. *acuminata* = *Q. muehlenbergii* Engelm.). The characters used to distinguish the taxa, whether species or varieties, include: number of teeth per leaf, growth habit, and leaf shape.



83. *Quercus prinoides* var. *acuminata* (Chinquapin Oak; Yellow Chestnut Oak). *a.* Leafy branch, $\times 1$. *b.* Leaf variation, $\times \frac{1}{2}$. *c.* Winter twig with buds, $\times 4$. *d.* Acorn, $\times 4$.



84. *Quercus prinoides* var. *acuminata* (Chinquapin Oak; Yellow Chestnut Oak). *e.* Twig with developing leaves and staminate inflorescences, $\times 2$. *f.* Stipules, $\times 20$. *g.* Staminate flowers, $\times 20$. *h.* Pistillate flowers, $\times 15$.

I have sampled populations of both taxa from locations in the central states where they overlap in distribution. Morphological features of each were analyzed and compared. While the plants were found to intergrade in all features, average differences could be demonstrated (Thomson, 1978).

Variety *prinoides* is a rhizomatous shrub of thin, exposed soils. On more favorable sites, it can become a small tree. On such sites, the trees are not joined by rhizomes. This variety is not known from Illinois. Variety *acuminata* is typically a tree of heavy limestone soils, but on exposed sites may be a shrub.

Plants of the two taxa demonstrate a preference for edaphic factors, principally soil pH. Shrubs are found on soils with a pH of 5–6, while trees prefer more basic soils with pH values of 6.0–6.8.

Because the plants were found to be reliably distinguishable on the basis of morphological criteria or habit in some parts of their common range, I prefer to treat them as a single species. However, because of their apparent preference for soils of different pH, the two varieties are maintained. Since variety *prinoides* does not occur in Illinois, a key to varieties is not included here.

Chinquapin oak is distinguished from other coarsely toothed oaks by its sharper pointed teeth and stellate foliar trichomes.

The wood of chinquapin oak is heavy, strong, durable, and close-grained. Its uses include fence posts, fuel, and railroad ties.

Hybrids between this species and *Q. alba* (*Q. X faxonii* Trel.) and *Q. macrocarpa* (*Q. X deamii* Trel.) have been reported from the state.

The binomial *Q. X deamii* was provided by Trelease (1924) for a tree believed to be the product of a cross between *Q. alba* and *Q. muehlenbergii* (= *Q. prinoides* var. *acuminata*). Specimens from the type tree and its progeny grown in botanical gardens led Bartlett (1951) to the conclusion that the original cross was between *Q. macrocarpa* and *Q. muehlenbergii* (= *Q. prinoides* var. *acuminata*). Believing *Q. X deamii* to be a cross involving either *Q. alba X muehlenbergii* or *Q. alba X bicolor*, Palmer (1948) proposed the new name *Q. X fallax* E. J. Palmer for *Q. macrocarpa X muehlenbergii*. In light of Bartlett's work, this must now be considered a synonym of *Q. X deamii*.

It should be noted that no binomial exists for *Q. alba X muehlenbergii*, if the position is taken that the two chinquapins are distinct species. As that is not the view taken here, the binomial *Q. X faxonii* Trel., based on individuals of *Q. alba X prinoides* var. *prinoides* occurring in Massachusetts and New York, is considered the correct name for the hybrids.

The flowers bloom from April to May.

15. *Quercus montana* Willd. Sp. Pl. 4:440. 1805. Fig. 85.

Quercus prinus L. Sp. Pl. 995. 1753 (*pro parte*).

Tree to 20 m, the trunk to 1 m in diameter, the crown broad but irregular; bark furrowed, dark brown; twigs stout, smooth, reddish brown; buds brown, pilose, pointed, 0.5–1.5 cm long; leaves ovate or oblong, rounded at apex, dentate, 10.0–22.5 cm long, 4–8

cm wide, pubescent on the lower surface by stipitate-fasciculate and fasciculate trichomes, the former crowded at the vein axils presenting a tufted appearance; petioles short, 0.5–2.5 cm long, stout, glabrous; staminate inflorescence an elongated, hirsute ament; pistillate inflorescence 1- to 3-flowered, the flowers on short, dark green peduncles; fruit solitary or in pairs, on peduncles 1–3 cm long, the nut chestnut brown, 2–3 cm long, 1–2 cm in diameter, enclosed for ½ its length by a cup with very tightly appressed scales.



COMMON NAME: Rock Chestnut Oak.

HABITAT: Upland woods, rocky slopes.

RANGE: Maine to southern Illinois, south to Mississippi, east to Georgia.

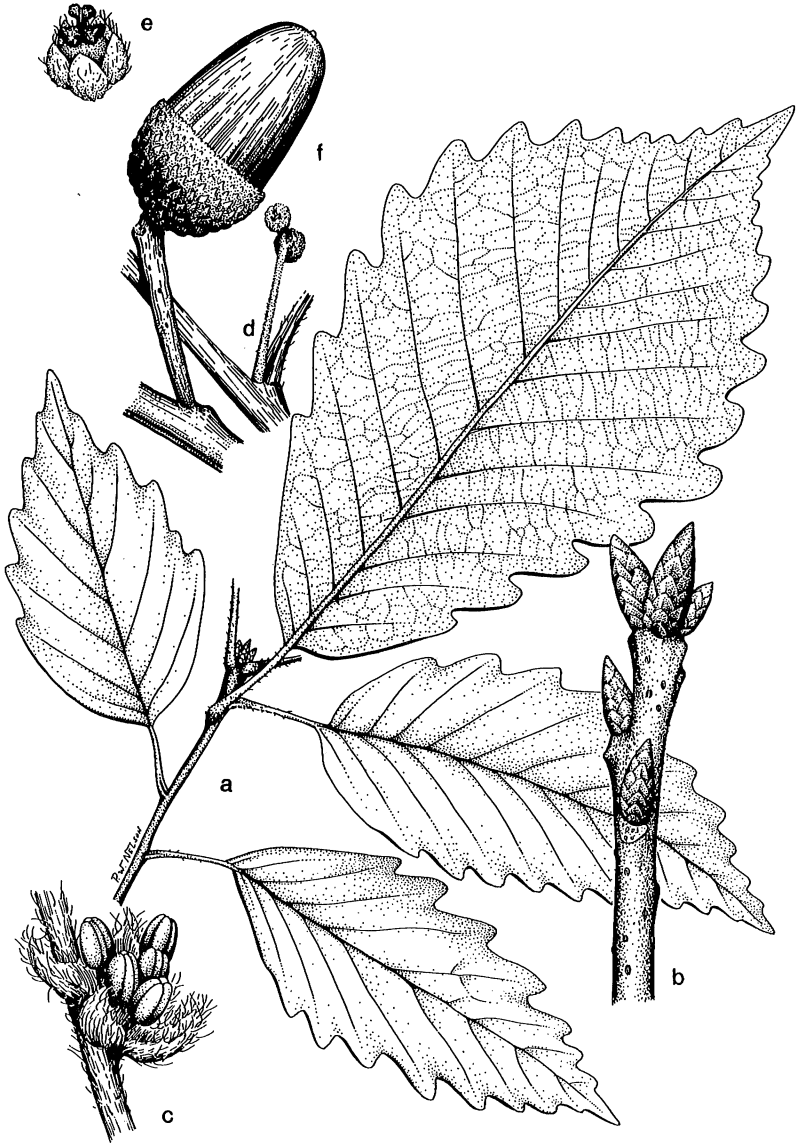
ILLINOIS DISTRIBUTION: Rare; known from only Hardin, Saline, Union, and Alexander counties.

Rock chestnut oak is distinguished from other coarsely toothed oaks by the tufted pattern of its foliar trichomes and its dark, furrowed bark.

The binomial *Q. prinus* L. was used by Linnaeus for the swamp chestnut oak. Engelmann (1877), in redesignating some type material, applied *Q. prinus* to the rock chestnut oak. In the meantime, Willdenow provided *Q. montana* for the rock chestnut oak (1805), and Nuttall (1818) provided *Q. michauxii* for the bottomland species. Sargent studied the Linnaean type material during the preparation of his manual and concluded that *Q. prinus* should be applied to the swamp chestnut oak. Authors of floras and checklists did not always follow this interpretation. Today it is not possible to know for certain to which species the binomial applies without the use of common names or ecological references. The International Code of Botanical Nomenclature provides for rejection of a binomial when its use results in confusion of application. Hardin (1979) has proposed that the name be rejected on this basis. The proposal is followed here.

In states where the trees are more prevalent, their hard, heavy, strong, close-grained wood is used for fencing material, for fuel, and in general construction.

During a visit to Union County in the fall of 1977, I observed that perhaps one-half of the Draper's Bluff population had been removed to make way for installation of a house trailer. This is most unfortunate since the trees are so uncommon in Illinois.



85. *Quercus montana* (Rock Chestnut Oak). *a.* Leafy branch, $\times 1$. *b.* Winter twig with buds, $\times 4$. *c.* Staminate flower, $\times 15$. *d.* Twig with pistillate flowers, $\times 2$. *e.* Pistillate flower, $\times 10$. *f.* Acorn, $\times 3$.

Rock chestnut oak hybridizes with *Q. alba* producing *Q. X saulii* Schneider and with *Q. stellata* producing *Q. X bernardiensis* W. Wolf. Only *Q. X saulii* has been reported for Illinois.

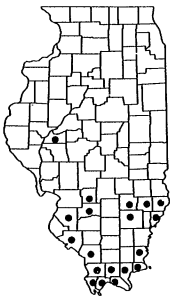
Flowers bloom from April to May.

16. *Quercus michauxii* Nutt. Gen. N. Am. Pl. 2:215. 1818. Fig. 86.

Quercus prinus L. Sp. Pl. 995. 1753 (*pro parte*).

Quercus houstoniana C. H. Muller, Am. Midl. Nat. 28:743. 1942.

Medium to large tree to 30 m tall, the trunk up to 1.5 m in diameter, the crown rounded; bark light gray or silvery white, scaly at maturity; twigs stout, light gray; buds ovoid, pointed, dark brown or reddish brown, lightly pubescent, 0.2–0.5 cm in length; leaves obovate or oblong-ovate, rounded at the apex, dentate, 10–20 cm long, 5–12 cm wide, densely pubescent on the lower surface with fasciculate and solitary, nonglandular trichomes and reddened, bulbous glandular ones; petioles hairy, stout, 1–4 cm long; staminate inflorescence 6–10 cm long, hairy; pistillate inflorescence a contracted, few-flowered spike, the flowers sessile or nearly so; fruit solitary or in pairs, sessile or on short peduncles up to 1.5 cm long, the nut ovoid, 2.5–3.5 cm long, 2–3 cm broad, $\frac{1}{3}$ to $\frac{1}{2}$ included in a thick, hairy cup.



COMMON NAMES: Swamp Chestnut Oak; Basket Oak; Cow Oak.

HABITAT: Low woods.

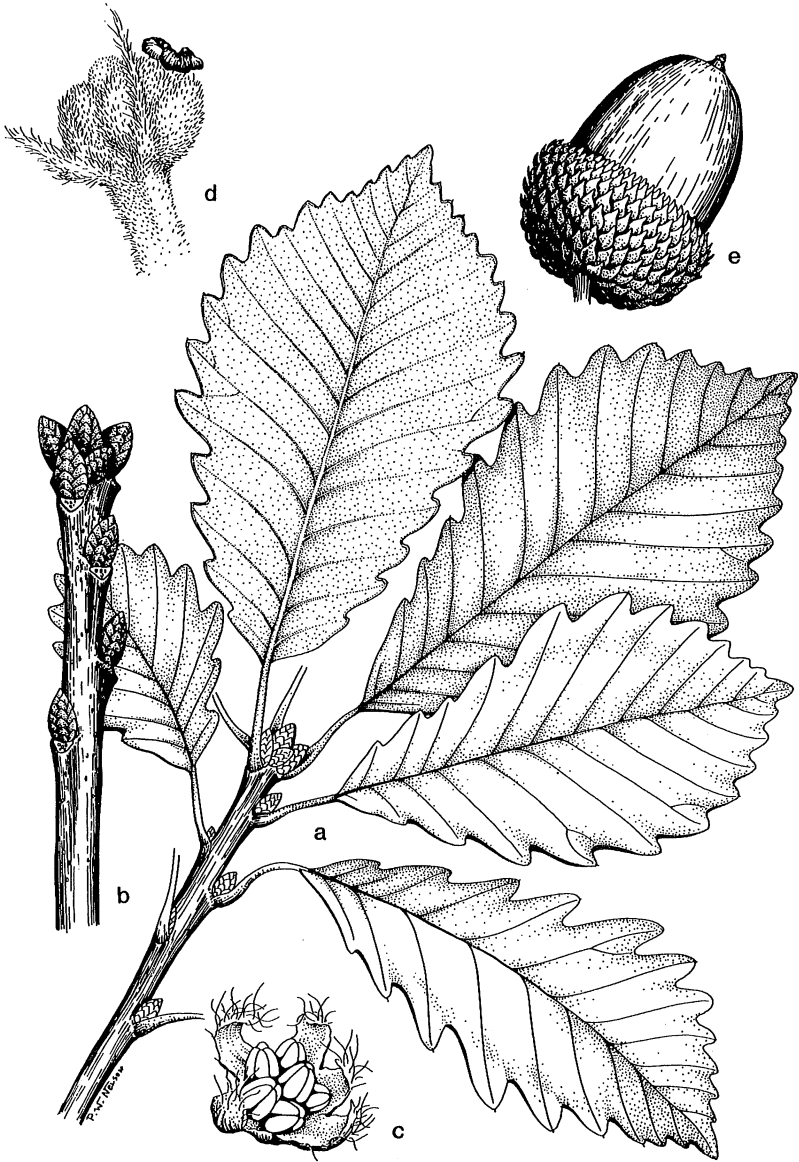
RANGE: New Jersey to southeast Missouri, south to eastern Texas, east to northern Florida.

ILLINOIS DISTRIBUTION: Infrequent to locally common in the southern third of the state; also Cass County.

Swamp chestnut oak is distinguished from other chestnut oaks by its leaves, which bear a dense tomentum on their lower surface and petioles, and its nearly sessile fruit.

The binomial *Q. prinus* L. has also been applied for this species. The interested reader should see the discussion under *Q. montana*.

The wood of swamp chestnut oak is tough, strong, durable, and hard. Consequently it has been put to many uses. It is able to be split into thin ribbons of fibers that have been woven into baskets. Thus, the sometimes-used common name, basket oak, is appro-



86. *Quercus michauxii* (Swamp Chestnut Oak; Basket Oak; Cow Oak). *a.* Leafy branch, $\times 1$. *b.* Winter twig with buds, $\times 2$. *c.* Staminate flower, $\times 20$. *d.* Pistillate flower, $\times 15$. *e.* Acorn, $\times 2\frac{1}{2}$.

priate. This same property has led to its use in producing braided chair seats and staves for barrel-making. The tough wood has been used also for making tool handles.

The nuts have the least tannic acid content of the eastern oaks and are sweet enough to be eaten out of hand.

Hybrids of this species and *Q. alba* (*Q. X beadleii* Schneid.) are known from the state.

The flowers bloom from April to May.

17. *Quercus bicolor* Willd. in Muhl. & Willd., Gesell. Naturf. Freunde Berlin Neue Schr. 3:396. 1801. Fig. 87.

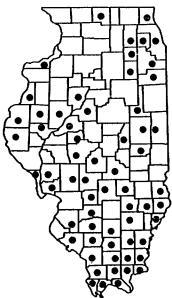
Quercus platanoides Lam. Encycl. Meth. Bot. 1:720. 1785, *nomen illeg.*

Quercus prinus L. var. *tomentosa* Michx. Hist. Chenes Am. pl. 9. 1801.

Quercus bicolor Willd. var. *mollis* Nutt. Gen. N. Am. Pl. 2:215. 1818.

Quercus platanoides (Lam.) Sudw. U.S. D. Agr. Rep. Sec. Agr. 1892: 327. 1893.

Tree to 30 m tall, up to 2 m in diameter, the crown round-topped; bark of mature trees gray, flaky; twigs slender, reddish brown, glabrous; buds ovoid, small, up to 0.5 cm in length, smooth or pilose at the tip; leaves obovate, with 4–8 pairs of often asymmetrical lobes, 11.0–16.5 cm long, 6–12 cm wide, the abaxial surface tomentose, white, the trichomes fasciculate and stellate; petioles 1.2–3.0 cm in length, yellowish and glabrous; staminate inflorescence 6–9 cm long, hairy; pistillate inflorescence 1- to 4-flowered, hairy; fruit on peduncles 3–8 cm in length, the nut ovoid, 2–3 cm in length, 1.5–2.2 cm in diameter, light brown, slightly pubescent at the apex, enclosed to $\frac{1}{3}$ its length by a warty cup.



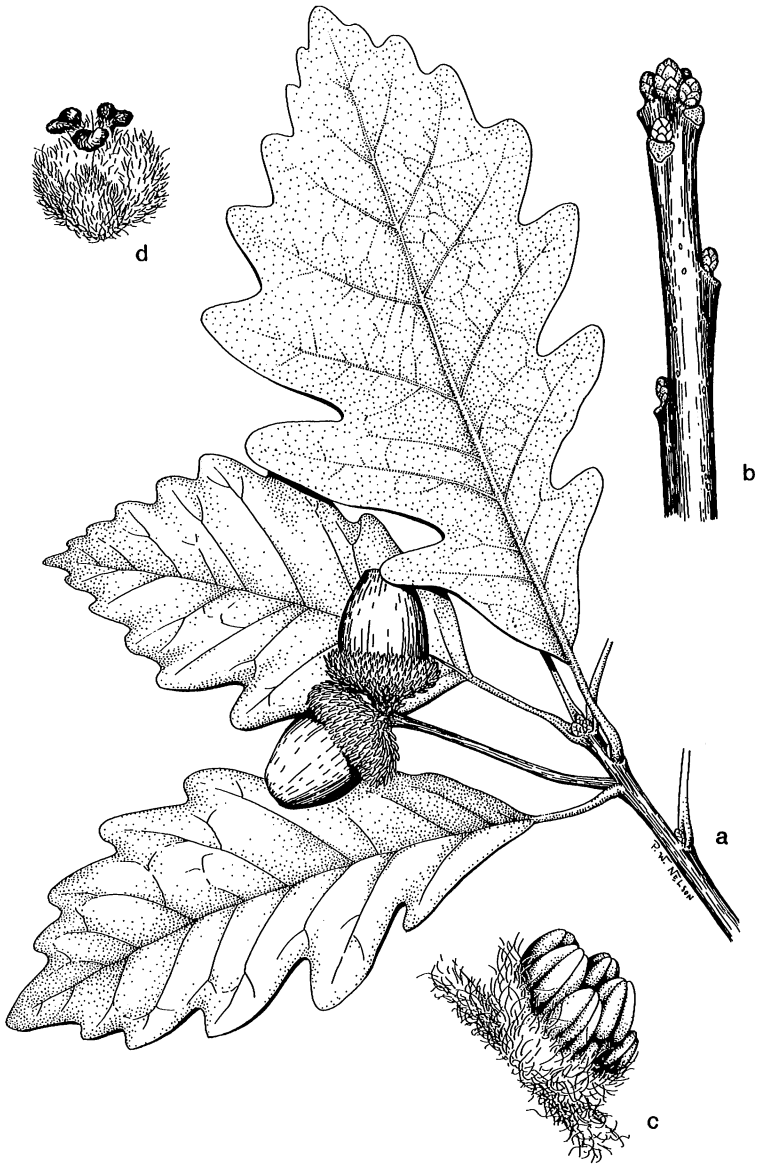
COMMON NAME: Swamp White Oak.

HABITAT: Bottomland forests, along streams, and in swamps.

RANGE: Maine to Quebec, south to Missouri and eastern Oklahoma, east to Georgia.

ILLINOIS DISTRIBUTION: Throughout most of the state, but not reported from the northwestern counties; infrequent when encountered.

Quercus bicolor is easily recognized by its conspicuous peduncles, which are the longest of all the eastern white oaks, and by the contrasting green upper surface



87. *Quercus bicolor* (Swamp White Oak). *a.* Leafy branch, with acorns, $\times 1$. *b.* Winter twig and buds, $\times 3$. *c.* Staminate flower, $\times 15$. *d.* Pistillate flower, $\times 15$.

and white, tomentose lower surface of its leaves. The sharp contrast of the colors accounts for the binomial.

The wood of swamp white oak is hard and durable. Its uses are not distinguished from those of the white oak by the lumber industry. A variety (*mollis* Nutt.) has been described whose leaves are less pubescent; however, the types of trichomes and their occurrence on the leaf are the same as for the typical variety. As I have observed both forms on the same tree, the variety is not maintained in this treatment.

Hybrids between this species and *Q. alba* (*Q. X jackiana* Schneid.), *Q. lyrata* (*Q. X humidicola* E. J. Palmer), and *Q. macrocarpa* (*Q. X schuettei* Trel.) have been reported from the state.

The flowers bloom from April to May.

18. *Quercus macrocarpa* Michx. Hist. Chenes Am. Sept.

Quercus No. 2, pls. 2, 3. 1801. *Figs.* 88, 89.

Quercus olivaeformis Michx. f. *Hist. Arb. For. Am. Sept.* 2:32, pl. 2. 1812.

Quercus obtusiloba Michx. β *depressa* Nutt. *Gen. N. Am. Pl.* 2:215. 1818.

Quercus macrocarpa Michx. var. *olivaeformis* (Michx. f.) A. Gray, *Man. Bot. North. U.S. ed. 2*, 404. 1856.

Quercus macrocarpa Michx. var. *depressa* (Nutt.) Engelm. *Acad. Sci. St. Louis Trans.* 3:382. 1876.

Quercus mandanensis Rydb. *Brittonia* 1:86. 1931.

Quercus macrocarpa Michx. ssp. *olivaeformis* (Michx. f.) A. Camus, *Chenes* 2:749. 1939.

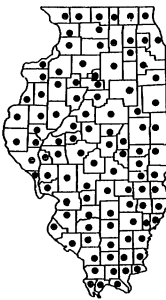
Large tree, up to 30 m in height, up to 3 m in diameter, the crown spreading; bark deeply furrowed, dark brown; twigs stout, dark brown, occasionally winged with corky ridges, glabrous; buds rounded, 0.2–0.5 cm long, glabrous or finely pubescent, subtended by narrow, stipular scales that often exceed them in length; leaves obovate or oblong, 10–27 cm in length, 10–20 cm wide, shallowly lobed in the upper half, divided by a pair of large sinuses in the lower half, or occasionally with large sinuses also in the upper half, the abaxial surface pubescent, the trichomes fasciculate and stellate; petioles glabrous, 1.5–3.0 cm long; staminate inflorescence 8–12 cm in length; pistillate inflorescence 1- to 3-flowered; flowers sessile or on short peduncles; fruit solitary or in pairs, sessile or attached to a peduncle up to 3 cm in length, the nut large, 2–4 cm long, 1.6–3.0 cm in diameter, dark brown, enclosed $\frac{1}{2}$ or more by a cup with uppermost scales elongated and fringed.



88. *Quercus macrocarpa* (Bur Oak; Mossy-cup Oak). *a.* Leafy branch, $\times \frac{2}{3}$. *b.* Pistillate flowers, $\times 15$. *c.* Acorn, $\times 1\frac{1}{2}$.



89. *Quercus macrocarpa* (Bur Oak; Mossy-cup Oak). d. Leaves, $\times 1$. e. Staminate flowers, $\times 20$.



COMMON NAMES: Bur Oak; Mossy-cup Oak.

HABITAT: Low rich bottomlands, or on dry hills in the northwestern portion of its range.

RANGE: Maine to Manitoba, south to Texas, east to Arkansas, Tennessee, and Maryland.

ILLINOIS DISTRIBUTION: Throughout the state; in every county.

Quercus macrocarpa is readily separated from other Illinois white oaks by its fan-shaped leaves that bear a large pair of sinuses near the base, and by the large acorns enclosed by a fringed cup.

Wood of the bur oak is similar in properties to other white oaks. It has similar uses.

Hybrids between this species and *Q. alba* (*Q. X bebbiana* Schneid.), *Q. bicolor* (*Q. X schuettei* Trel.), and *Q. prinoides* (*Q. X deamii* Trel.) are known from the state.

Flowers bloom from April to May.

19. **Quercus stellata** Wangenh. Beitr. Teutsch. Holzger. Fortwiss. Anpflanz. Nordamer. Holz. 78, pl. 6, fig. 15. 1787.

Figs. 90, 91.

Quercus alba minor Marsh. Arb. Am. 120. 1785.

Quercus obtusiloba Michx. Hist. Chenes Am. pl. 1. 1801.

Quercus minor (Marsh.) Sarg. Gard. & Forest 2:471. 1889.

Quercus stellata Wangenh. var. *parviloba* Sarg. Bot. Gaz. 65:441. 1918.

Quercus stellata Wangenh. var. *paludosa* Sarg. Bot. Gaz. 65:441. 1918.

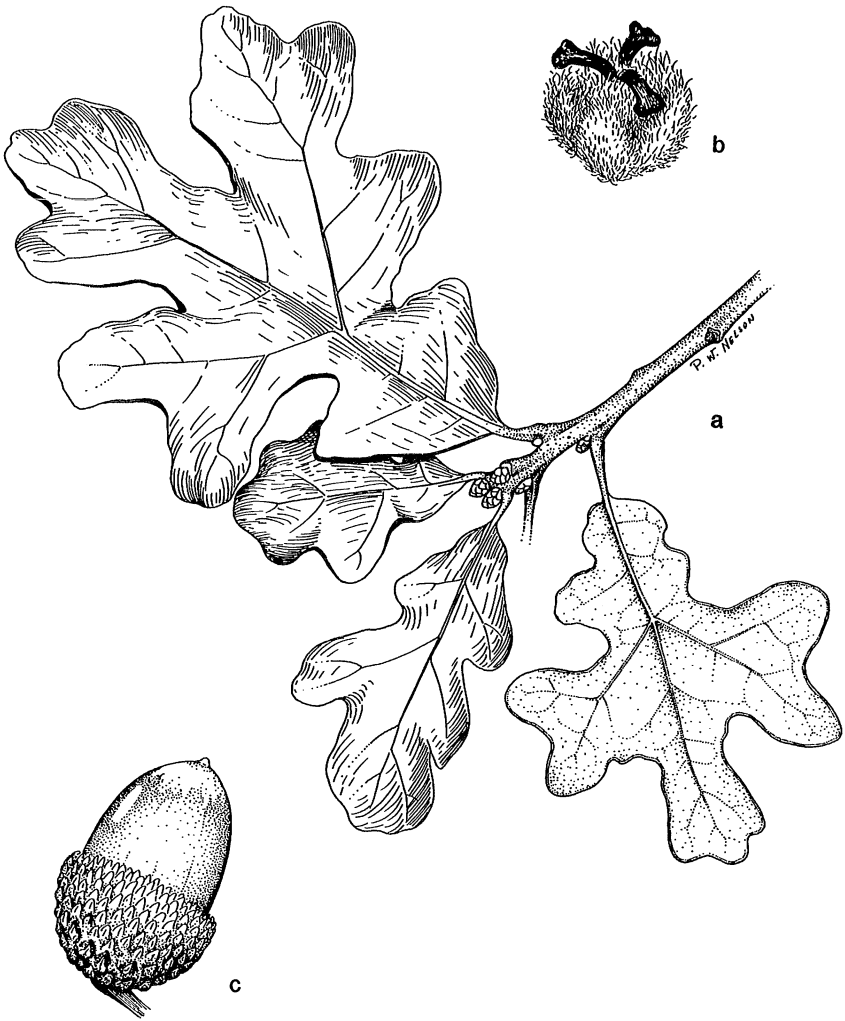
Quercus stellata Wangenh. var. *attenuata* Sarg. Bot. Gaz. 65:457. 1918.

Quercus ashei Sterrett. Jour. Elisha Mitchell Sci. Soc. 37:178. 1922.

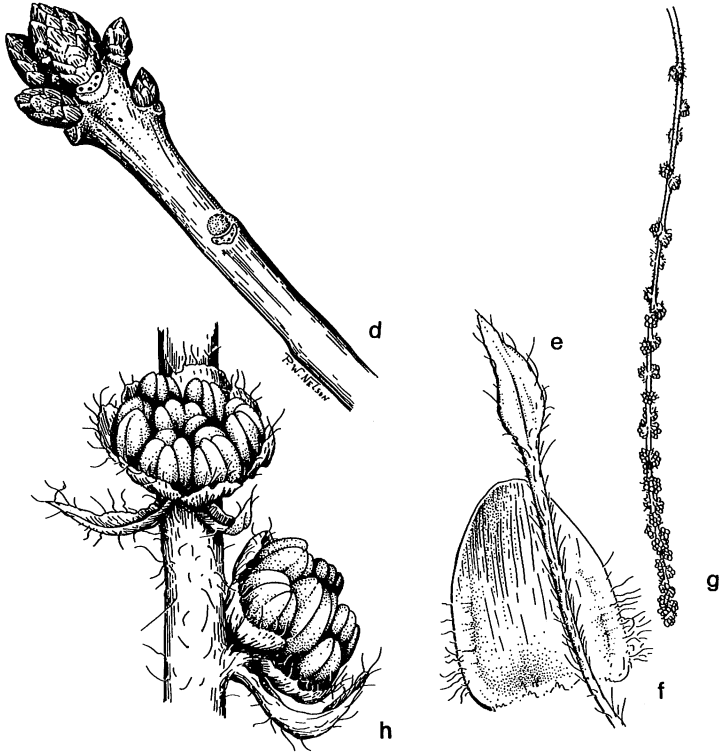
Quercus similis Ashe. Jour. Elisha Mitchell Sci. Soc. 40:43. 1924.

Quercus stellata similis (Ashe) Sudw. U.S. D.A. Misc. Cir. 92:107. 1927.

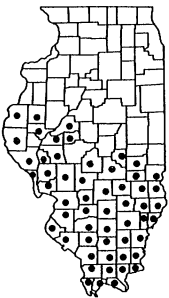
Tree to 15 m tall (rarely to 20 m), up to 1 m in diameter, the crown rounded; bark orange-brown, fissured into squarish plates in mature trees; twigs orange-brown, pubescent, stout; buds ovoid, reddish-brown, 0.2–0.3 cm long; leaves oblong-obovate, 5-lobed, the upper pair squarish, forming a cross with the main axis, the lamina 10–27 cm in length, 10–20 cm wide, the abaxial surface pubescent, the trichomes fasciculate, attached to the veins; petioles glabrous or pubescent, 1.0–2.5 cm long; staminate inflorescence pubescent, 3.5–12.5 cm long; pistillate inflorescence 1- to 5-flowered, finely pubescent, the flowers sessile or nearly so; fruit solitary or in pairs, occasionally in clusters of three, sessile or on peduncles up to 1 cm in length, the nut ovoid, 1.0–1.5 cm long, 0.8–1.2 cm in diameter, pale brown, striate, half-enclosed by the reddish brown, pubescent cup.



90. *Quercus stellata* (Post Oak). a. Leafy branch, $\times 1$. b. Pistillate flower, $\times 15$. c. Acorn, $\times 5$.



91. *Quercus stellata* (Post Oak). d. Winter twig with buds, $\times 4$. e. Stipule, $\times 20$. f. Bud scale, $\times 15$. g. Staminate inflorescence, $\times 2$. h. Staminate flowers, $\times 15$.



COMMON NAME: Post Oak.

HABITAT: Dry woods and bluffs; sometimes in moister areas, being the dominant species in post oak flats.

RANGE: Massachusetts to southern Iowa and eastern Kansas, south to eastern Texas, east to Florida.

ILLINOIS DISTRIBUTION: Occurs primarily in the southern half of the state.

Quercus stellata is recognized by its lobed leaves that form a cross in the upper half.

Wood of the post oak is hard, heavy, and close-grained. Its uses include fence posts, fuel, barrel-making, and

furniture. The presence of post oaks on a site often is considered suggestive of poor agricultural soils.

Post oak hybridizes with more species of eastern white oaks than any other except *Q. alba*. In Illinois, crosses between post oak and *Q. alba* (*Q. X fernowi* Trel.) are known.

Illinois botanists called this species *Q. obtusiloba* until 1880. The flowers appear in April and May.

20. *Quercus lyrata* Walt., Fl. Carol. 235. 1788. Fig. 92.

Tree up to 25 m high, trunk up to 1.5 m in diameter, the crown rounded; bark gray or grayish-brown, divided into flat, sometimes squarish plates; twigs glabrate, grayish-brown, slender; buds rounded, 0.2–0.3 cm long, brown, glabrous; leaves oblong or ovate, with 5–7 squarish lobes, the sinuses shallow or deep, the lamina 10–25 cm long, 6–12 cm wide, the abaxial surface pubescent or nearly glabrous, the trichomes fasciculate and stellate or fasciculate and solitary; petioles smooth or hairy, stout, up to 5 cm in length; staminate inflorescence hairy, up to 15 cm long; pistillate inflorescence 1- to 3-flowered, sessile or short-stalked, hairy; fruit solitary or in pairs, sessile or attached to peduncles up to 5 cm in length, the nut globose, up to 3 cm in diameter, nearly enclosed by the cup.



COMMON NAME: Overcup Oak.

HABITAT: Low woods and swamps.

RANGE: Southern Virginia to eastern Texas, north along the Mississippi Valley to southern Missouri, southern Illinois, and southern Indiana; also in Delaware, Maryland, and New Jersey; southward to Florida.

ILLINOIS DISTRIBUTION: Restricted to the major drainage systems of southern Illinois; infrequent.

Overcup oak is recognized by the squarish lobes of its leaves and the acorn cup that nearly encloses the nut.

A leaf form that is less hairy is sometimes seen on individuals of this species. The difference, however, is not just a matter of fewer trichomes. The pubescence of typical leaves is due to a combination of fasciculate and stellate trichomes. The smoother leaves possess fasciculate and solitary types. Whether these correlate with any ecological preference remains to be established. They are not treated differently here.



92. *Quercus lyrata* (Overcup Oak). a. Leafy branch, $\times 1$. b, c. Leaf variations, $\times 1$. d. Winter twig with buds, $\times 3$. e. Staminate flower, $\times 15$. f. Pistillate flowers, $\times 10$. g. First year acorns, $\times 2$. h. Acorn, $\times 2$.

The wood of overcup oak is hard, heavy, strong, and durable. It has been used in interior finishing, for cabinets, as fuel, and for fence posts.

Hybrids between this species and other white oaks have not been reported from the state.

The flowers bloom from April to May.

BETULACEAE—BIRCH FAMILY

Trees or shrubs; leaves alternate, simple, stipulate; flowers unisexual, the staminate usually in elongated, pendulous catkins, the pistillate pendulous or erect, short; sometimes woody; calyx in the staminate flowers 2- to 4-parted, absent in the pistillate flowers; petals absent; stamens 2 or 4; ovary superior; ovule 1; fruit a nutlet subtended or leathery or woody bracts.

The Betulaceae are made up of two genera and about 85 species found mostly in the Northern Hemisphere. Some botanists combine the Betulaceae with the Corylaceae, but there seem to be several significant differences between the two families to justify their separation.

KEY TO THE GENERA OF Betulaceae IN ILLINOIS

1. Bracts woody, persistent; leaves orbicular to obovate ----- 2. *Alnus*
1. Bracts leathery, deciduous; leaves ovate to oblong ----- 1. *Betula*

1. *Betula* [Tourn.] L. —Birch

Trees or shrubs, often aromatic, the bark sometimes peeling into papery shreds; winter buds with many scales; leaves alternate, simple, toothed, stipulate; flowers unisexual, the staminate in elongated, pendulous catkins, the pistillate in short, erect spikes; staminate flowers 3 together, subtended by a bract, with a (2-) 4-toothed calyx, no petals, and 2 stamens; pistillate flowers 2-3 together, subtended by a 3-lobed bract, with no sepals and no petals, and with a sessile ovary with 2 styles; fruit a small, winged nut.

Betula is a genus of 35 often attractive woody plants found in north temperate and arctic regions of both the Old and the New World. Many of the arctic species are dwarfed shrubs. Several species are grown as ornamentals.

Five native species and two hybrids occur in Illinois.

KEY TO THE TAXA OF *Betula* IN ILLINOIS

1. Leaves with 8 or more pairs of lateral veins ----- 2
1. Leaves with up to 7 (-8) pairs of lateral veins ----- 3
 2. Bark yellowish- or silvery-gray, peeling off in thin layers; leaves thin, green beneath ----- 1. *B. alleghaniensis*
 2. Bark brownish to pinkish, peeling off in shaggy pieces; leaves firm, pale beneath ----- 2. *B. nigra*
3. Bark peeling off in thin layers; small trees ----- 4
3. Bark close, not peeling off in thin layers; shrubs ----- 5
 4. Leaves pubescent along the veins; most or all the fruiting spikes 3 cm long or longer ----- 3. *B. papyrifera*
 4. Leaves glabrous beneath; most or all the fruiting spikes less than 3 cm long ----- 4. *P. populifolia*
5. Leaves acute to acuminate, some or all over 3 cm long ----- 6
5. Leaves obtuse to subacute, usually not more than 3 cm long -----
 - 7. *B. pumila*
 6. Bark dark brown; fruiting spikes less than 1 cm thick -----
 - 5. *B. X sandbergii*
 6. Bark gray; fruiting spikes at least 1 cm thick ----- 6. *B. X purpusii*

1. *Betula alleghaniensis* Britt. Bull. Torrey Club 31:166. 1904.

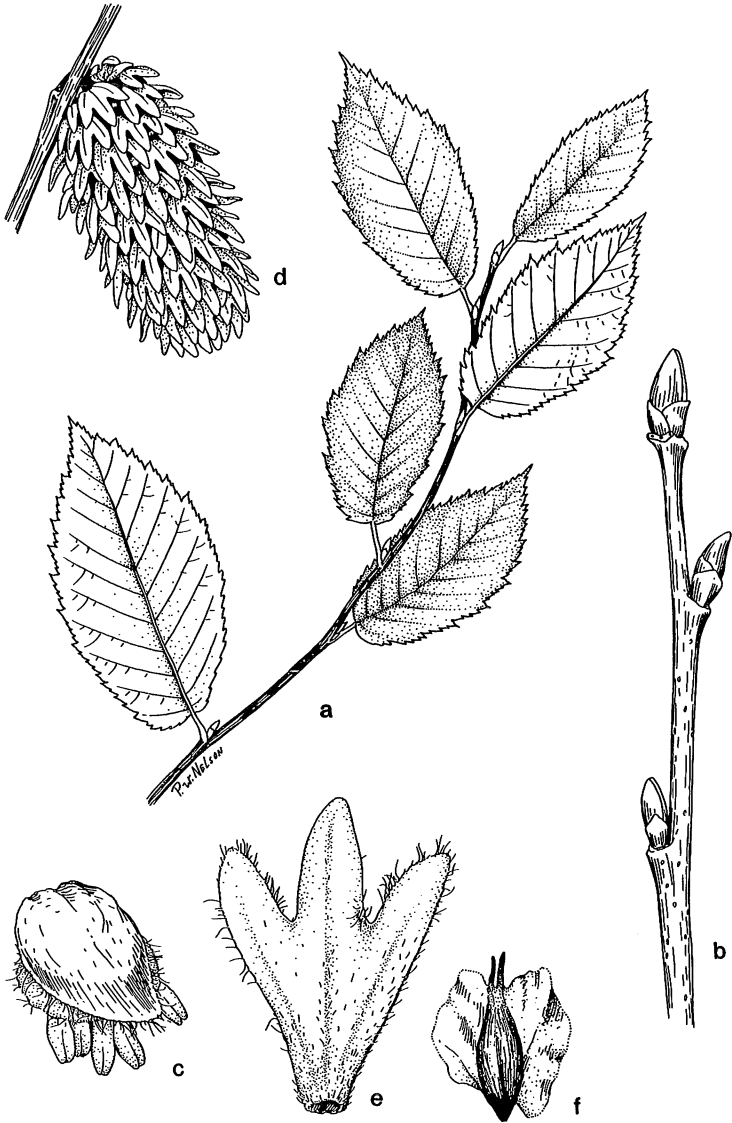
Fig. 93.

Betula lutea Michx. f. Arb. Am. 2:152. 1812, *nomen illeg.*

Betula lutea Michx. f. var. *macrolepis* Fern. Rhodora 24:170. 1922.

Betula alleghaniensis Britt. var. *macrolepis* (Fern.) Brayshaw, Can. Field-Nat. 80:161. 1966.

Tree to 30 m tall (less in Illinois), with a trunk diameter up to 1.2 m, with spreading, often pendulous branches; bark yellowish- or silvery-gray, becoming separated in thin scales rolled up on the edges; twigs at maturity brown and glabrous, the winter buds ovoid, acute, brown, up to 5 mm long; leaves thin, oblong-ovate to ovate, acute to acuminate at the apex, rounded at the sometimes asymmetrical base, sharply doubly serrate, dark green and dull on the upper surface, green beneath with pubescent veins, up to 10 cm long, up to 5 cm broad; petioles slender, hairy, up to 2 cm long; staminate catkins usually 2-4 together, pendulous, up to 8 cm long, up to 6 mm thick, light brown; pistillate catkins sessile, erect, oblongoid, up to 3 cm long, becoming about as broad as long in fruit, the bracts up to 12 mm long, pubescent; nut oblongoid to ellipsoid, up to nearly 3 mm long, broader than its wings.



93. *Betula alleghaniensis* (Yellow Birch). a. Leafy branch, $\times 1$. b. Winter twig and buds, $\times 4$. c. Staminate flower, $\times 10$. d. "Cone," $\times 3$. e. Pistillate bract, $\times 8$. f. Nut, $\times 15$.



COMMON NAME: Yellow Birch.

HABITAT: Boggy woods.

RANGE: Newfoundland to Manitoba, south to Iowa, Illinois, Ohio, West Virginia, and Virginia; Georgia.

ILLINOIS DISTRIBUTION: Known only from Du Page, Kane, Lake, Lee, Ogle, and Winnebago counties.

This species is better known as *B. lutea*, but this binomial is illegitimate.

The yellow birch, a tree more common to the north and east of Illinois, is rare in boggy woods of extreme northern Illinois.

Most of the Illinois specimens have bracts subtending pistillate flowers mostly 8–12 mm long, making them referable to var. *macrolepis*, if so desired.

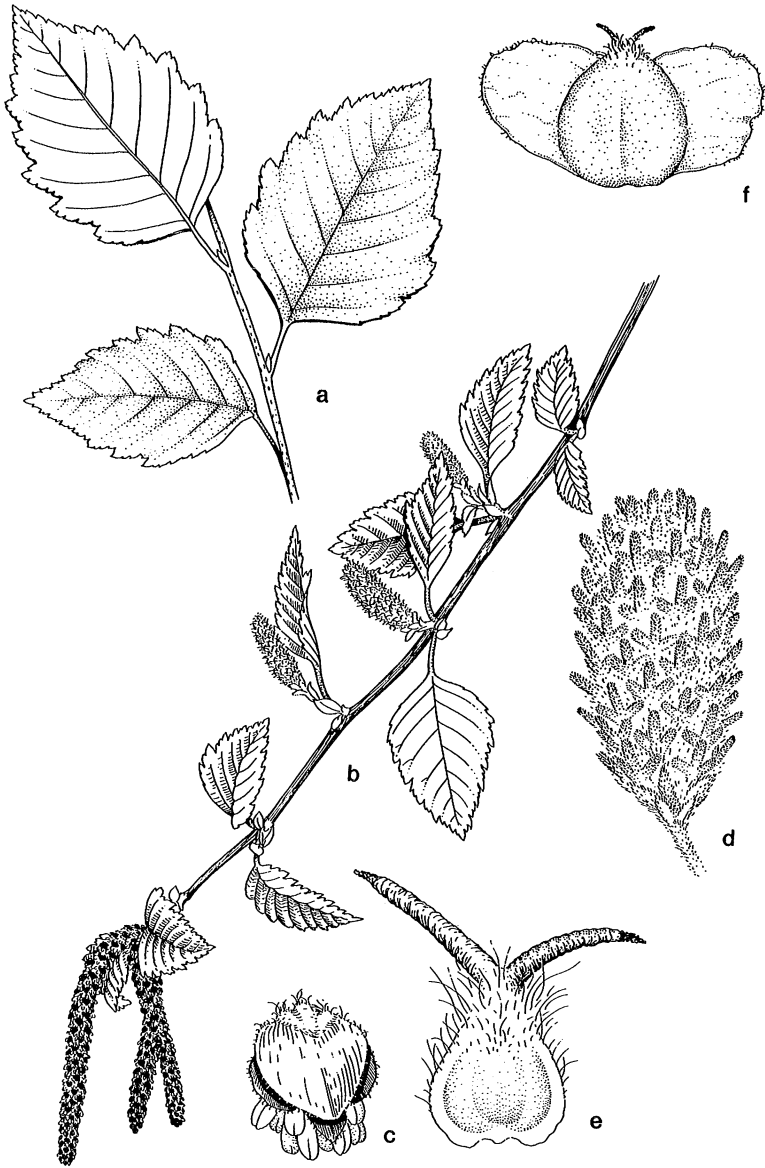
The leaves turn a clear yellow in the autumn. The twigs, when crushed, have the odor of wintergreen.

The flowers bloom from mid-April through May.

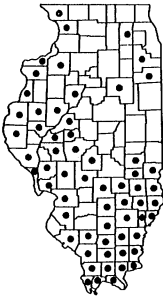
2. *Betula nigra* L. Sp. Pl. 982. 1753. Fig. 94.

Betula rubra Michx. f. Hist. Arb. 2:143. 1812.

Tree to 30 m tall, with a trunk diameter up to 4.5 m, with slender branches forming an irregular crown; bark reddish-brown, peeling off into thin, irregularly shaped flakes curling up along the edges; twigs red-brown, heavily lenticellate, the winter buds ovoid, acute, up to 5 mm long; leaves firm, ovate to oblong-ovate, acute at the apex, somewhat tapering or more or less rounded at the base, sharply doubly serrate, deep green and shiny on the upper surface, pale and pubescent beneath at first, becoming glabrous except on the veins; up to 7 cm long, up to 5 cm broad; petioles slender, hairy, up to 10 mm long; staminate catkins usually 2–4 together, pendulous, up to 7 cm long, up to 6 mm thick, brown; pistillate catkins short-pedunculate, erect, oblongoid, up to 7 mm long, the bracts up to 7 mm long, pubescent on the back and white-ciliate; nut ovoid to ellipsoid, up to nearly 3 mm long, about as broad as the wing.



94. *Betula nigra* (River Birch; Red Birch). a. Leafy Branch, $\times 1$. b. Leafy branch, with catkins, $\times 1$. c. Staminate flower, $\times 10$. d. Pistillate catkin, $\times 15$. e. Pistillate flower, $\times 15$. f. Nut, $\times 12$.



COMMON NAMES: River Birch; Red Birch.

HABITAT: Along rivers and streams; wet ground.

RANGE: New Hampshire to Minnesota, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Occasional in the southern half of the state, becoming less common northward.

The bark of the river birch is distinctive, flaking off into thin, pinkish pieces that curl up along the edges.

Because of its handsome appearance, the river birch is frequently grown as an ornamental. The hard, strong, pale brown wood is used in making furniture.

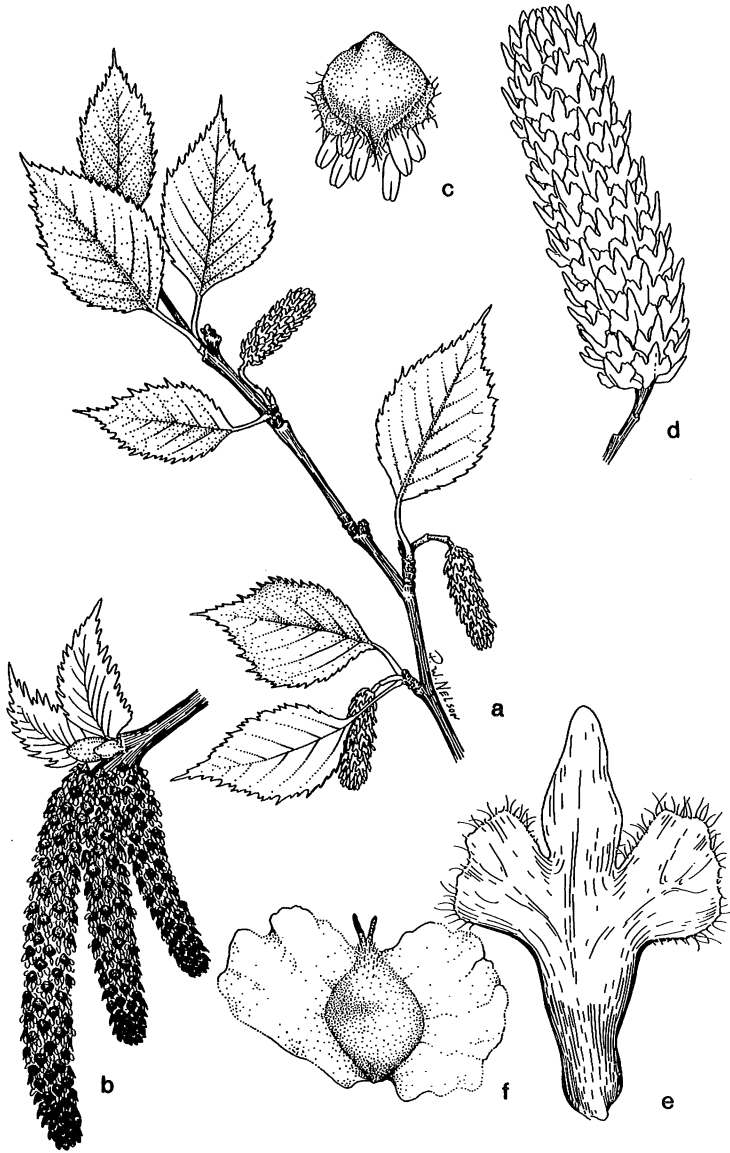
River birch flowers from early April to mid-May.

3. *Betula papyrifera* Marsh. Arbust. Am. 19. 1785. Fig. 95.

Betula papyracea Ait. Hort. Kew. 3:337. 1789.

Betula alba L. var. *papyrifera* (Marsh.) Spach, Ann. Sci. Nat. II, 15:187. 1841.

Tree to 20 m tall, with a trunk diameter up to 0.75 m, with slender, pendulous branches; bark cream to sometimes orange-tinted, separating into thin, papery layers; twigs at first orange, then changing to deep orange-brown and finally white, lenticellate, the winter buds obovoid, acute, brown, resinous, up to 5 mm long; leaves firm, ovate, acute to acuminate at the apex, more or less rounded at the base, coarsely doubly serrate, dark green on the upper surface, pale yellow green on the lower surface, the lower surface glabrous or with tufts of axillary hairs, usually dotted with black glands, up to 7 cm long, up to 4.5 cm broad; petioles stout, yellow, glabrous or pubescent, glandular, up to 16 mm long; staminate catkins usually several in a cluster, pendulous, up to 8 cm long, up to 7 mm thick, red-brown; pistillate catkins arching or becoming somewhat pendulous, pedunculate, oblongoid-cylindrical, up to 2.5 cm long, becoming 3–4 cm long in fruit, the bracts usually 3-lobed; nut ellipsoid, 1.5–2.0 mm long, much narrower than the wing.



95. *Betula papyrifera* (Paper Birch; Canoe Birch). *a*. Leafy branch, with catkins, $\times 1$. *b*. Young branch, with staminate catkins, $\times 3$. *c*. Staminate flower, $\times 10$. *d*. "Cone," $\times 4$. *e*. Pistillate bract, $\times 8$. *f*. Nut, $\times 20$.



COMMON NAMES: Paper Birch; Canoe Birch.

HABITAT: Wooded ravines and low dune ridges.

RANGE: Labrador to Alaska, south to South Dakota, Iowa, Illinois, Ohio, and West Virginia.

ILLINOIS DISTRIBUTION: Known only from the extreme northern two tiers of counties.

In the Chicago area, Swink and Wilhelm (1979) record this species from Lake Bluff growing in cool, wooded ravines where it is found with *Acer saccharum*, *Aralia nudicaulis*, *Aster macrophyllus*, *Cornus rugosa*, *Maianthemum canadense* var. *interius*, *Pedicularis canadensis*, *Solidago flexicaulis*, *Thalictrum dioicum*, and *Tilia americana*. They also indicate that paper birch is a residual plant that exists on low dune ridges in the city of Zion.

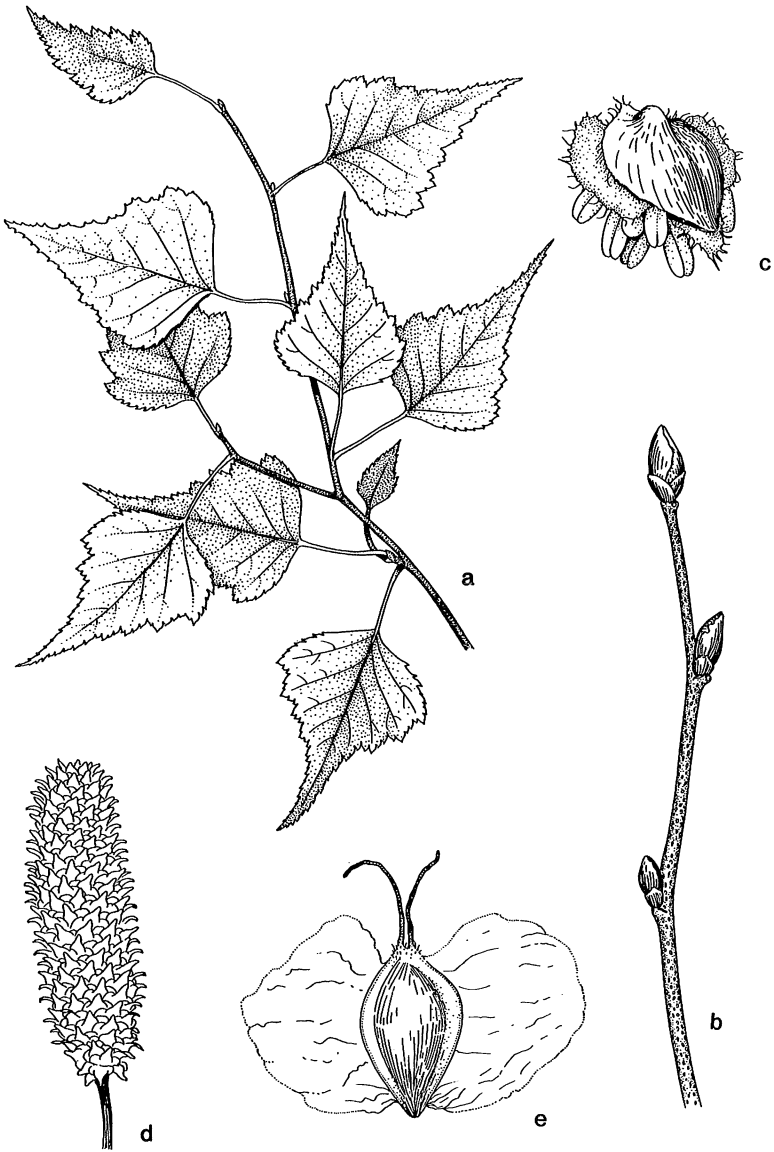
Specimens with slightly subcordate leaf bases have been referred to var. *cordifolia*, but I do not believe the true var. *cordifolia* occurs in Illinois.

This species is frequently grown as a handsome ornamental.

Betula papyrifera flowers from mid-April to mid-May.

4. *Betula populifolia* Marsh. Arb. Am. 19. 1785. Fig. 96.

Small tree to 10 m tall, with a trunk diameter rarely exceeding 0.5 m, with slender, pendulous branches, often forming a pyramidal crown; bark reddish-brown, becoming white with maturity, not peeling into shreds or flakes; twigs slender, yellowish to reddish-brown, lenticellate, the winter buds ovoid, acute, brown, glabrous, up to 5 mm long; leaves thin, more or less triangular, acuminate at the apex, truncate to subcordate at the base, coarsely doubly serrate, with many of the teeth glandular, dark green and shiny on the upper surface, glabrous but sometimes glandular on either or both surfaces, up to 7 cm long, up to 5 cm broad; petioles slender, glabrous but with black glands, up to 2 cm long; staminate catkins solitary or rarely in pairs, pendulous, up to 10 cm long, up to 3 mm thick, brown; pistillate catkins short-pedunculate, slenderly cylindrical, up to 1 cm long, in fruit becoming 1.5 cm long and 7 mm thick, with 3-lobed, glandular bracts; nut ellipsoid to obovoid, up to 3 mm long, slightly narrower than its wing.



96. *Betula populifolia* (Gray Birch). a. Leafy branch, $\times 1$. b. Winter twig and buds, $\times 4$. c. Staminate flower, $\times 10$. d. "Cone," $\times 8$. e. Nut, $\times 20$.



COMMON NAME: Gray Birch.

HABITAT: Thickets.

RANGE: Nova Scotia to Ontario, south to northern Illinois, northern Indiana, northern Ohio, and Virginia.

ILLINOIS DISTRIBUTION: Known only from Cook, Kane, Kendall, McHenry, and Winnebago counties.

The gray birch usually sprouts profusely from old stumps. The leaves turn pale yellow in the autumn.

This is the most recently found birch in the Illinois flora, first discovered by Dan K. Evans in Winnebago County in 1972.

Swink and Wilhelm (1979) believe that the Cook and McHenry county specimens are from naturalized populations.

The flowers appear from mid-April to mid-May.

5. *Betula X sandbergii* Britt. Bull. Torrey Club 31:166. 1904.
Fig. 97.

Shrub or small tree to 10 m tall, with a trunk diameter up to 25 cm; bark dark reddish-brown, not peeling into shreds or flakes; twigs slender, rusty-pubescent when young, usually glandular, the winter buds ovoid, acute, up to 5 mm long; leaves oval to ovate to rhombic, acute at the apex, rounded or tapering to the base, serrate, dull green on the upper surface, pale and sometimes pubescent on the lower surface, with glandular dots, up to 5 cm long, up to 3 cm broad; petioles slender, smooth or slightly hairy, up to 1 cm long; staminate catkins solitary or paired, pendulous, up to 5 cm long, up to 5 mm thick, brown; pistillate catkins short-pedunculate, more or less erect, oblongoid-cylindric, up to 1.5 cm long, up to 5 mm thick, becoming up to 2.5 cm long and 7 mm thick in fruit, the bracts up to 4 mm long, pubescent; nut ellipsoid, up to 3 mm long, narrower than the wings.



97. *Betula X sandbergii* (Sandberg's Birch). *a.* Leafy branch, with catkins, $\times 1$. *b.* Leaf, $\times 1$. *c.* Staminate flower, $\times 10$. *d.* "Cone," $\times 4$. *e.* Pistillate bract, $\times 8$. *f.* Nut, $\times 12$.



COMMON NAME: Sandberg's Birch.

HABITAT: Boggy woods.

RANGE: Saskatchewan to Montana, south to Minnesota and Illinois.

ILLINOIS DISTRIBUTION: Known only from Kane and Lake counties.

This taxon is reputed to be a hybrid between *B. alleghaniensis* and *B. pumila* var. *glandulifera*. It appears to have more characteristics of *B. pumila* var. *glandulifera*, but differs by its more pointed, longer leaves. It may be distinguished from *B. X purpusii* by its dark

brown bark and more slender fruiting spikes.

This hybrid usually flowers during May.

6. *Betula X purpusii* Schneid. Illustr. Handb. Laubh. 1:102. 1904. Fig. 98.

Shrub or small tree to 7 m tall, with a trunk diameter up to 20 cm; bark gray, not peeling into shreds or flakes, the inner bark scented with wintergreen; twigs slender, usually pubescent when young, often glandular, the winter buds ovoid, acute, up to 4.5 mm long; leaves oval to ovate to rhombic, acute at the tip, rounded or tapering to the base, serrate, dull green on the upper surface, pale and sometimes pubescent on the lower surface, usually with glandular dots, up to 5 cm long, up to 3 cm broad; petioles slender, smooth or slightly hairy, up to 1 cm long; staminate catkins solitary or in pairs, pendulous, up to 5 cm long, up to 5 mm thick, brown; pistillate catkins short-pedunculate, erect, up to 1.5 cm long, up to 1 cm thick, becoming up to 3 cm long and 1.0–1.2 cm thick in fruit, the bracts up to 6 mm long, pubescent; nut ellipsoid, up to 4 mm long, narrower than the wings.



COMMON NAME: Purpus' Birch.

HABITAT: Boggy woods.

RANGE: Ontario to Minnesota, south to northern Illinois and northern Indiana.

ILLINOIS DISTRIBUTION: Known only from Lake County.

Like *B. X sandbergii*, this taxon is also a reputed hybrid between *B. alleghaniensis* and *B. pumila* var. *glandulifera*. It has the bark characteristics similar to that of *B. alleghaniensis*. The fruiting spikes are thicker than those of *B. X sandbergii*.

This hybrid flowers during May.



98. *Betula X purpusii* (Purpus' Birch). a. Leafy branch with developing "cone," $\times 1$. b. "Cone," $\times 4$. c. Pistillate bract, $\times 8$. d. Nut, $\times 12$.

7. *Betula pumila* L. Mant. 124. 1767.

Shrub to 3 m tall; twigs slender, brown, pubescent or rarely glabrous, glandular or eglandular, the winter buds ovoid, more or less acute, up to 5 mm long; leaves obovate to orbicular, obtuse to subacute at the apex, rounded to tapering at the base, coarsely toothed, dull green and usually glabrous on the upper surface, paler and pubescent or glabrous on the lower surface, usually up to 3 cm long, up to 2.5 cm broad; petioles pubescent or glabrous, up to 6 mm long; staminate catkins few together, pendulous, up to 4 cm long, up to 5 mm thick, brown; pistillate catkins up to 1.5 cm long, becoming up to 3 cm long and 1 cm broad in fruit, with bracts pubescent, 3-lobed, with the middle lobe much elongated; nut oblongoid, up to 4 mm long, usually a little broader than the wings.

Three varieties, based on vegetative characters and sometimes intergrading, are found in Illinois.

KEY TO THE VARIETIES OF *B. pumila* IN ILLINOIS

1. Young twigs pubescent, often densely so; leaves usually pubescent on the lower surface ----- 2
1. Twigs glabrous or nearly so; leaves glabrous on the lower surface -----
----- 7c. *B. pumila* var. *glabra*
2. Twigs eglandular; lower surface of leaves pubescent, eglandular ---
----- 7a. *B. pumila* var. *pumila*
2. Twigs glandular; lower surface of leaves pubescent or nearly glabrous, glandular ----- 7b. *B. pumila* var. *glandulifera*

7a. *Betula pumila* L. var. *pumila* Fig. 99.

Twigs densely pubescent, at least when young, eglandular; lower surface of leaves pubescent, eglandular.



COMMON NAME: Dwarf Birch.

HABITAT: Bogs.

RANGE: Newfoundland to Ontario, south to northern Illinois, northern Ohio, and New Jersey.

ILLINOIS DISTRIBUTION: Confined to the extreme northern counties of the state.

Typical var. *pumila*, which lacks glands on the twigs and lower leaf surfaces, may sometimes intergrade with var. *glandulifera*.

The two varieties sometimes occur together.

Flowers appear during May.

- 7b. *Betula pumila* L. var. *glandulifera* Regel, Bull. Soc. Nat. Moscou 38:410. 1865. *Not illustrated.*
Betula glandulifera (Regel) Butler, Bull. Torrey Club 36:425. 1909.**

Twigs pubescent, at least when young, glandular; lower surface of leaves pubescent or nearly glabrous, glandular.



COMMON NAME: Dwarf Birch.

HABITAT: Bogs.

RANGE: Quebec to British Columbia, south to Montana, North Dakota, northern Illinois, northern Indiana, and New York.

ILLINOIS DISTRIBUTION: Known only from Lake and Winnebago counties.

Variety *glandulifera*, although apparently rarer than var. *pumila* in Illinois, has a broader overall distribution across northern North America.

The flowers are borne in May.

- 7c. *Betula pumila* L. var. *glabra* Regel, Bull. Soc. Nat. Moscou 38, pl. 2. 1861. *Not illustrated.***

Twigs and lower leaf surfaces glabrous.



COMMON NAME: Smooth Dwarf Birch.

HABITAT: Bogs.

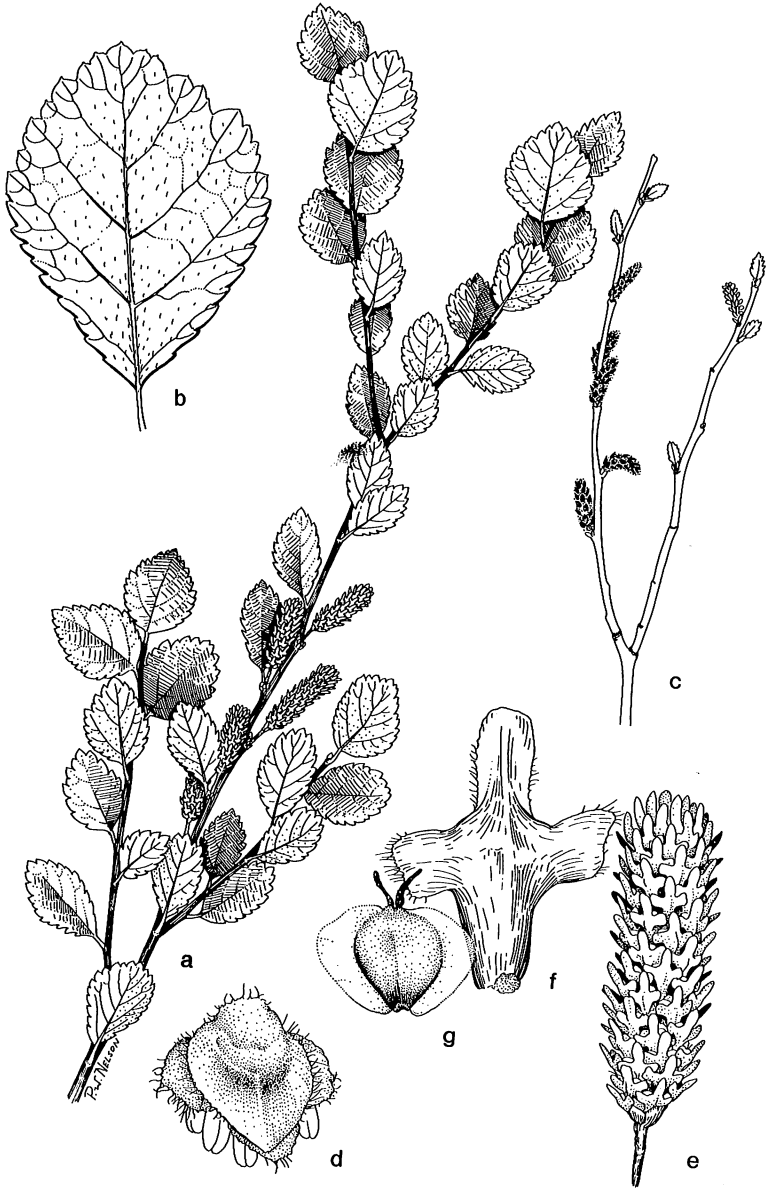
RANGE: Michigan; northern Illinois; northern Indiana.

ILLINOIS DISTRIBUTION: Known from a single collection from Lake County.

Variety *glabra* differs from the other varieties of *B. pumila* in Illinois by its glabrous twigs and leaves. It is apparently very rare throughout its limited range.

2. *Alnus* Mill.—Alder

Shrubs or trees, the bark usually remaining tight; winter buds with few scales; leaves alternate, simple, toothed, stipulate; flowers unisexual, borne in catkins; the staminate catkins slender and pendulous, the pistillate catkins shorter, thicker, and more or less erect; staminate flowers usually borne 3 or 6 together, subtended by a bract, each flower composed of a 4-lobed calyx and 4 stamens; pistillate flowers usually 2–3 together, subtended by a bract, each flower composed only of an inferior ovary and 2 styles; fruit com-



99. *Betula pumila* (Dwarf Birch). *a.* Leafy branch with "cones," $\times 1$. *b.* Leaf, $\times 4$. *c.* Twig with staminate catkins, $\times 1$. *d.* Staminate flower, $\times 10$. *e.* "Cone," $\times 5$. *f.* Pistillate bract, $\times 8$. *g.* Nut, $\times 10$.

posed of woody bracts subtending small, compressed, winged or wingless nuts.

Alnus is a genus of about fifteen species native to the northern hemisphere of both the Old and New World and in the Andes of South America. Two native and one naturalized species occur in Illinois.

KEY TO THE SPECIES OF *Alnus* IN ILLINOIS

1. Tree with a single trunk; leaves dentate, with up to 7 pairs of lateral veins ----- 1. *A. glutinosa*
1. Small tree or shrub, with several stems; leaves serrate or serrulate, with 8 or more pairs of lateral veins ----- 2
 2. Leaves ovate to elliptic, whitened beneath ----- 2. *A. rugosa*
 2. Leaves obovate, green beneath ----- 3. *A. serrulata*

1. *Alnus glutinosa* (L.) Gaertn. Fruct. & Sem. Pl. 2:54. 1791.

Fig. 100.

Betula alnus α *glutinosa* L. Sp. Pl. 983. 1753.

Alnus vulgaris Hill, Brit. Herb. 510. 1756.

Betula glutinosa L. Syst. Nat. ed. 10, 2:1265. 1759.

Alnus alnus (L.) Britt. in Britt. & Brown, Ill. Fl. 1:613. 1913.

Tree to 15 m tall (in Illinois), much larger in Europe, forming a rounded crown; bark dark, more or less smooth; young branches smooth but usually gummy; leaves dark green, obovate to nearly orbicular, rounded at the apex, tapering to the base, dentate, glabrous above, pubescent on the veins below, up to 12 cm long, up to 9 cm broad, with petioles up to 2 cm long; catkins appearing before the leaves, the staminate up to 10 cm long, the pistillate ovoid to oblongoid, up to 1 cm long; fruiting "cone" up to 1.5 cm long, borne on a slender stalk; nut wingless.



COMMON NAMES: Black Alder; European Alder.

HABITAT: Naturalized along rivers and streams.

RANGE: Native of Europe; sometimes escaped from cultivation in the United States but infrequently naturalized.

ILLINOIS DISTRIBUTION: Known from Cook, Du Page, and Will counties in the northeastern corner of the state and from Jackson, Johnson, and Union counties in the southwestern corner of the state; also Vermilion County.

The black alder, a native of Europe, is the only species



100. *Alnus glutinosa* (Black Alder; European Alder). a. Leafy branch with staminate catkins and mature "cones," $\times 1\frac{1}{2}$. b. Staminate flower, $\times 10$. c. Pistillate bract, $\times 8$. e. Nut, $\times 10$.

of alder in Illinois that grows as a single-trunked tree. It is sometimes planted as an ornamental in Illinois. Several specimens are naturalized along rivers and streams in the state.

The flowers bloom in late March and early April.

2. *Alnus rugosa* (DuRoi) Spreng. var. *americana* (Regel) Fern. Rhodora 47:350. 1945. Fig. 101.

Alnus incana β *americana* Regel, Mem. Soc. Imp. Nat. Moscou Nouv. 13:155. 1861.

Alnus americana (Regel) Czerep. Notul. Syst. Inst. Bot. Komarov. Acad. Sci. URSS 17:103. 1955.

Shrub to 5 m tall; bark smooth, brown to dark gray, bearing conspicuous white lenticels; twigs glabrous or nearly so; leaves ovate to elliptic, obtuse to subacute at the apex, more or less rounded at the base, singly or doubly serrulate, glabrous or nearly so, sometimes pubescent on the veins below, green on the upper surface, whitened on the lower surface, up to 12 cm long, up to 10 cm broad, with petioles up to 2 cm long; catkins appearing before the leaves, the staminate up to 7 cm long, the pistillate ovoid to oblongoid, up to 1 cm long; fruiting "cone" up to 1.5 cm long, sessile or borne on a short stalk; nut orbicular, narrowly marginate.



COMMON NAME: Speckled Alder.

HABITAT: Moist thickets.

RANGE: Labrador to Saskatchewan, south to northern Iowa, northern Illinois, northern Indiana, West Virginia, and Maryland.

ILLINOIS DISTRIBUTION: Restricted to a few extreme northern counties.

Speckled alder derives its name from the conspicuous white lenticels on the dark bark. The white lower leaf surface distinguishes this species from the usually similar-appearing *A. serrulata*.

Although some recent botanists have proposed that this species is best treated as a subspecies of *A. incana*, I am unable to accept that placement of the speckled alder.

The speckled alder flowers from mid-March to mid-April.

3. *Alnus serrulata* (Ait.) Willd. Sp. Pl. 4:336. 1805. Fig. 102.

Betula serrulata Ait. Hort. Kew. 3:338. 1789.

Shrub or several-stemmed small tree to 7 m tall; bark smooth, brown to dark gray, bearing pale lenticels; young branchlets usually pubescent, at maturity becoming glabrous; leaves obovate, obtuse at the apex, tapering to the base, singly serrate, glabrous on the upper surface, usually pubescent, at least on the veins, below, green on both sides, up to 10 cm long, up to 8 cm broad, with petioles up to 2 cm long; catkins appearing before the leaves, the



101. *Alnus rugosa* (Speckled Alder). a. Leafy branch, with "cones," $\times 1$. b. Twig with staminate catkins, $\times 2$. c. Staminate flower, $\times 10$. d. Pistillate bract, $\times 8$. e. Nut, $\times 10$.



102. *Alnus serrulata* (Hazel Alder; Common Alder; Smooth Alder). *a.* Leafy branch with "cones," $\times 1\frac{1}{2}$. *b.* Twig with pistillate (erect) catkins and a staminate (pendulous) catkin, $\times 2$. *c.* Staminate flower, $\times 10$. *d.* Pistillate bract, $\times 8$. *e.* Nut, $\times 10$.

staminate up to 10 cm long, the pistillate ovoid, up to 1 cm long; fruiting "cone" up to 1.5 cm long, sessile or on a short stalk; nut ovoid, narrowly marginate.



COMMON NAMES: Hazel Alder; Common Alder; Smooth Alder.

HABITAT: Along rocky streams.

RANGE: Nova Scotia to New York to Ohio to Missouri, south to Louisiana and Florida.

ILLINOIS DISTRIBUTION: Occasional in the southern one-third of the state.

This species is common along clear, rocky streams in extreme southeastern Illinois, but it is rare in other parts of southern Illinois and absent in central and northern Illinois.

The flowers begin to open in late March.

CORYLACEAE—HAZELNUT FAMILY

Trees or shrubs; leaves alternate, simple, stipulate; flowers unisexual, the staminate usually in elongated, pendulous catkins, the pistillate pendulous or erect, short; calyx absent in the staminate flowers, 2- to 4-parted in the pistillate flowers; petals absent; stamens more than 4; ovary inferior; ovules 2; fruit a nut, enclosed in an involucre.

Although the genera assigned to the Corylaceae are sometimes included in the Betulaceae, there is ample evidence that the two families are distinct. As interpreted in this work, the Corylaceae consist of four genera and about 85 species.

KEY TO THE GENERA OF Corylaceae IN ILLINOIS

1. Bracts foliaceous, flat, not inflated, usually lobed, or cleft ----- 2
1. Bracts not foliaceous, inflated, neither lobed nor cleft ---- 1. *Ostrya*
 2. Nuts enclosed by the bracts----- 2. *Corylus*
 2. Nuts seated in, but not enclosed by, the bracts ----- 3. *Carpinus*

1. *Ostrya* Scop.—Hop Hornbeam

Trees with thin, grayish brown, flaky bark; twigs slender, wiry, reddish brown, terete; buds small, acute; leaves alternate, simple, serrate; staminate flowers in pendulous catkins; stamens 3–15, subtended by sharp-pointed, ovate bracts; pistillate flowers in drooping

catkins, in pairs, each at the base of an ovate, acute, short-ciliate bract; fruit a nut enclosed in a membranaceous involucre.

Ostrya is a genus with four species occurring in the northern hemisphere. Two are found in the United States. *Ostrya virginiana* (Mill.) K. Koch occurs in the eastern United States and *O. knowltonii* Cov. in the west.

1. *Ostrya virginiana* (Mill.) K. Koch, Dendrol. 2:8 1873. Fig. 103.

Carpinus ostrya L. Sp. Pl. 998, 1753.

Carpinus virginiana Mill. Gard. Dict., ed. 8, No. 4. 1768.

Ostrya virginiana (Mill.) K. Koch f. *glandulosa* Spach, Ann. Sci. Nat. Bot. 16:246. 1841.

Ostrya virginiana (Mill.) K. Koch var. *glandulosa* (Spach) Sarg. Bot. Gaz. 67:216. 1919.

Ostrya virginiana (Mill.) K. Koch var. *lasia* Fern. Rhodora 38:414. 1936.

Tree up to 12 m tall, to 2 dm in diameter, the crown open and rounded; bark thin, light brown, divided into flaky, platelike scales; twigs slender, tough, orange to reddish-brown, glabrescent; buds acute, ovoid, light brown, up to 0.5 cm long; leaves oblong-lanceolate, acute at the apex, sharply serrate, with conspicuous tufts of hairs in the vein axils of the abaxial surface, the petioles short, up to 2 cm long, terete, hairy; staminate flowers in aments up to 6 cm in length, the flowers subtended by short, broadly obovate bracts; pistillate flowers in slender aments up to 2 cm long, the flowers subtended by narrow bracts; fruit a nut up to 8 mm long, up to 3 mm broad, enclosed by inflated scales, the scales thin and light green.



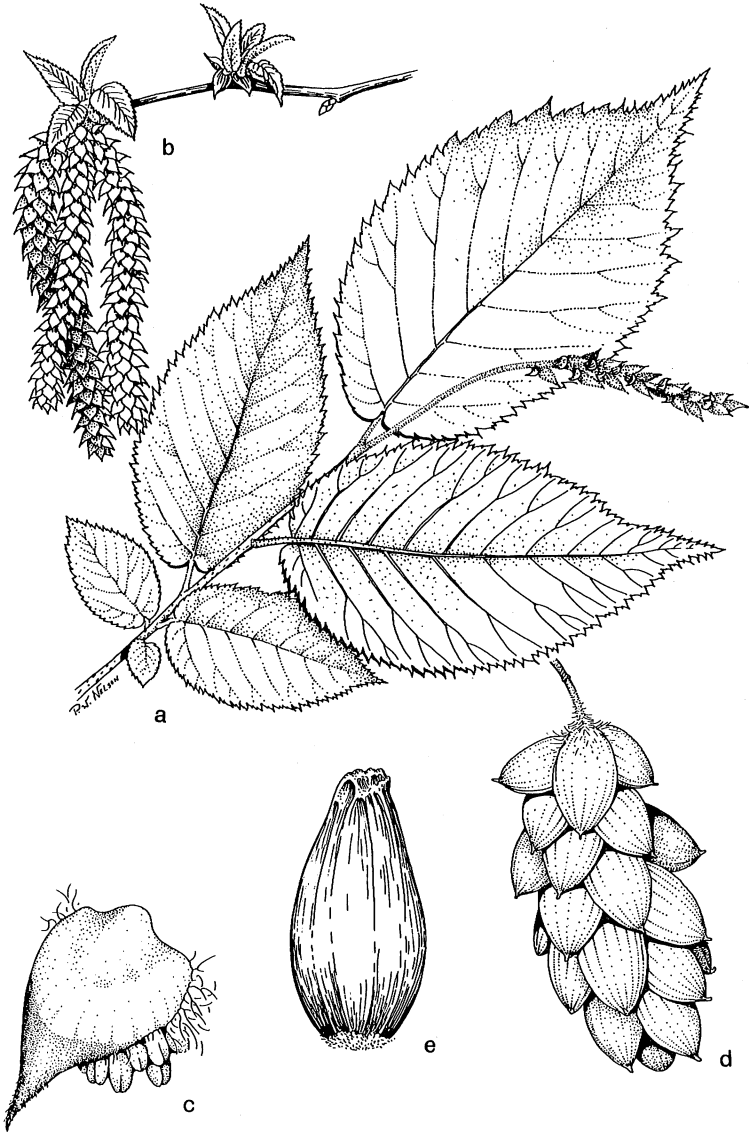
COMMON NAMES: Hop Hornbeam; Ironwood.

HABITAT: Upland woods; rocky slopes, along streams.

RANGE: Southern Canada, from Nova Scotia to Manitoba, south to Texas, and east to Florida.

ILLINOIS DISTRIBUTION: Throughout the state; in every county.

Hop hornbeam is a common component of the understory of Illinois forests. It generally resembles elms and blue beech, but differs from the former in its symmetrical leaf base and the latter by its scaly bark. When the fruit is mature, each nut is surrounded by an inflated bladder making the whole resemble fruit of the hops.



103. *Ostrya virginiana* (Hop Hornbeam; Ironwood). *a.* Leafy branch with immature fruits, $\times \frac{1}{2}$. *b.* Branch showing staminate catkins and opening leaves, $\times 2$. *c.* Staminate flower, $\times 10$. *d.* "Cone," $\times 5$. *e.* Nut, $\times 10$.

The wood of hop hornbeam is extremely hard and heavy, thus accounting for the sometimes-used name of ironwood. Because of the small size of the trees, the wood is of little commercial value, but has been used in fashioning handles for axes and other tools.

The fruit is also neglected by man because of its small size, but is not overlooked by birds, deer, and rodents.

Hop hornbeam is an often anonymous component of our forests, its features are subtle, and structures of little economic value, yet it is part of the intricacy that makes the forest wonderfully complex.

The flowers open in April or May, but the male catkins are present through the winter preceding anthesis.

2. *Corylus* L.—Hazelnut

Shrubs or small trees; leaves simple, alternate, petiolate; staminate flowers appearing in fall, flowering the following spring; stamens 4, subtended by bracts; pistillate flowers in an ovoid bud, the stigma of each exerted from the bud, each subtended by 3 minute bracts; fruit a nut, enclosed in foliaceous bracts.

Corylus is a genus of the northern hemisphere in both the Old and New World. *Corylus avellana* L., the European filbert, is sometimes planted for its edible nuts. Two species occur in Illinois.

KEY TO THE SPECIES OF *Corylus* IN ILLINOIS

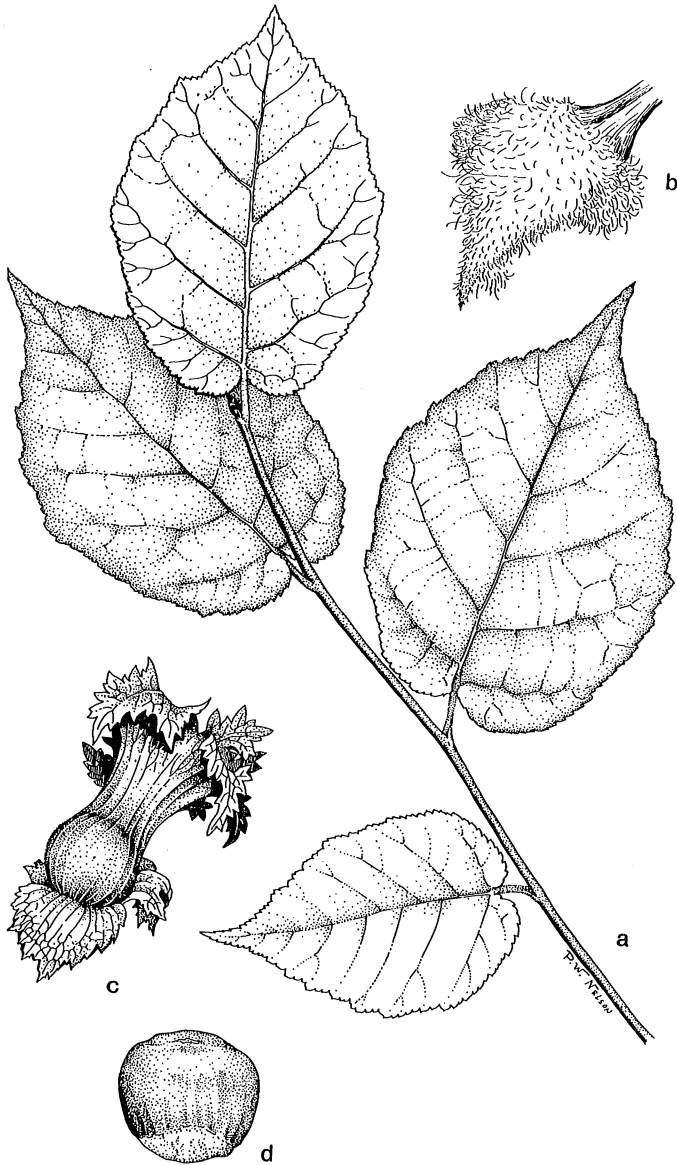
1. Leaves serrulate, densely hairy on the lower surface; bracts of the involucre 2 and free to the base, not bristly-hairy, up to 3 cm long; petioles glandular-pubescent..... 1. *C. americana*
1. Leaves coarsely toothed as well as serrulate, usually hairy only along the veins of the lower surface; bracts of the involucre 2 and united below, bristly-hairy, at least near the tip, usually more than 3 cm long; petioles not glandular-pubescent..... 2. *C. rostrata*

1. *Corylus americana* Walt. Fl. Carol. 236. 1788. Fig. 104.

Corylus americana Walt. var. *missouriensis* A. DC. Prodr. 16:132. 1864.

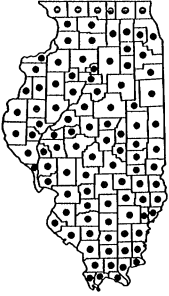
Corylus americana Walt. f. *missouriensis* (A. DC.) Fern. Rhodora 34:96. 1932.

Colonial shrub to 3 m tall, the crown open or densely crowded; twigs reddish-brown, pubescent, with stipitate glands; buds ovoid, red-brown, pubescent, up to 3 mm long; leaves ovate, doubly serrulate, often with shallow lobes, acute to acuminate at the apex, cordate to truncate at the base, densely pubescent beneath, up to



104. *Corylus americana* (Hazelnut; American Filbert). *a*. Leafy branch, $\times 1$. *b*. Staminate flower, $\times 10$. *c*. Fruit enclosed by leafy bracts, $\times 2$. *d*. Nut, $\times 3$.

15 cm long, up to 11 cm broad; petiole up to 1 cm long, pubescent, stipitate-glandular; staminate flowers in aments formed during the previous growing season; pistillate flowers formed in the preceding season, 6–12 in axillary buds, subtended by minute bracts; fruit a nut, 1.0–1.5 cm long, enclosed by 2 free, lacinate, not bristly foliaceous bracts up to 3 cm long.



COMMON NAMES: Hazelnut; American Filbert.

HABITAT: Dry or moist areas; edges of forests; along roads; in fence rows.

RANGE: Maine to Saskatchewan, south to Oklahoma, east to Georgia.

ILLINOIS DISTRIBUTION: Throughout the state; in every county.

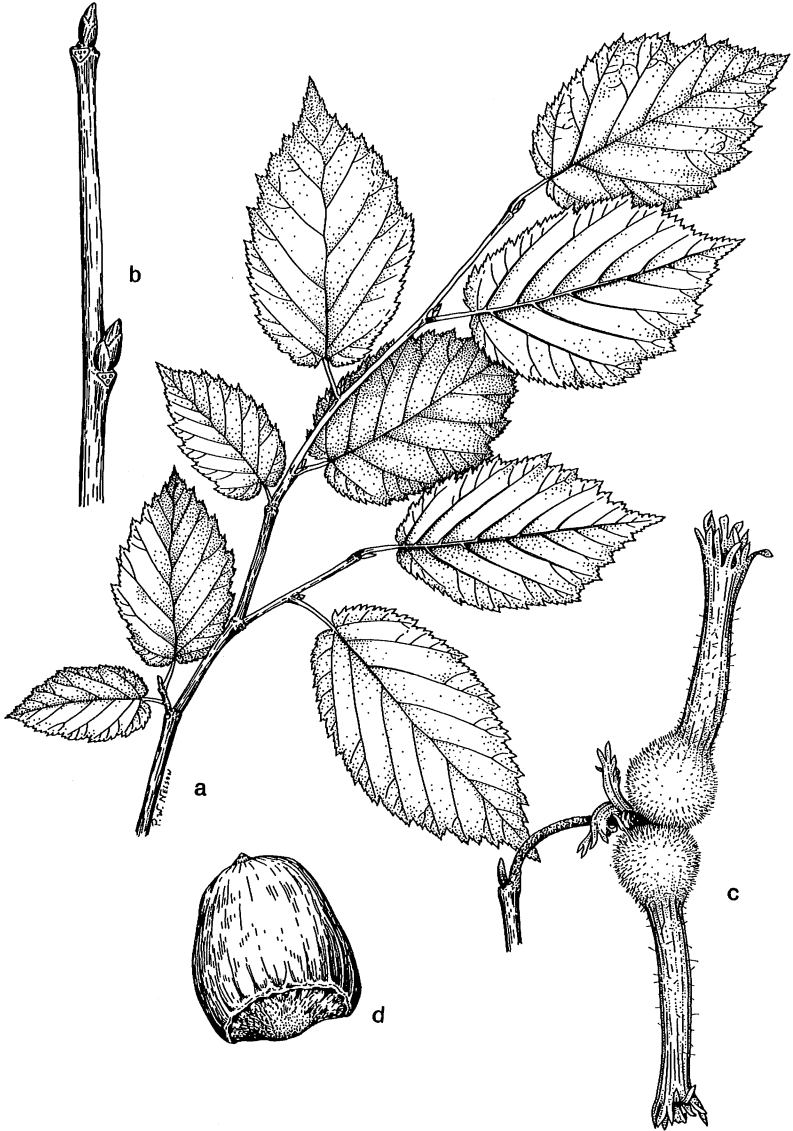
Hazelnut is a shrub prized for its edible nuts. The kernels may be ground for flour, eaten raw, or be included in cookies and candy.

Forma *missouriensis* (A.DC.) Fern. has been recognized, but not maintained here. The distinction has been based upon the absence of gland-tipped hairs. I have found this to be quite variable within the typical forma and not associated with any particular habitat.

Flowers bloom from March to May.

2. *Corylus rostrata* Ait. Hort. Kew. 3:364. 1789. Fig. 105.

Shrub to 3 m tall, the crown open or densely crowded; twigs reddish-brown, pubescent but not glandular; buds ovoid, red-brown, pubescent, up to 3.5 mm long; leaves ovate, coarsely toothed as well as doubly serrulate, acute to acuminate at the apex, cordate to truncate at the base, usually hairy only along the veins of the lower surface, up to 10 cm long, up to 7 cm broad; petiole up to 1 cm long, pubescent but not glandular; staminate flowers in aments formed during the previous growing season; pistillate flowers formed in the preceding season, 6–12 in axillary buds, subtended by minute bracts; fruit a nut, 1.0–1.5 cm long, enclosed by 2 united, lacinate, bristly-hairy bracts more than 3 cm long.



105. *Corylus rostrata* (Beaked Hazelnut). *a.* Leafy branch, $\times 1$. *b.* Winter twig, $\times 3$. *c.* Pair of fruits enclosed by leafy bracts, $\times 2$. *d.* Nut, $\times 3$.



COMMON NAME: Beaked Hazelnut.

HABITAT: Wooded ravine (in Illinois).

RANGE: Newfoundland to British Columbia, south to Oregon, Kansas, Missouri, Illinois, Ohio, Tennessee, and Georgia.

ILLINOIS DISTRIBUTION: Known only from Jo Daviess County.

The beaked hazelnut was first collected in Illinois from a wooded ravine in Jo Daviess County in 1981 by John Schwegman.

The presence of the long, tubular involucre in fruit readily distinguishes this species from *C. americana*. Vegetative differences are not too reliable.

This species flowers during April and May.

3. *Carpinus* L. —Blue Beech

Trees with smooth, thin, ashy-gray bark; twigs slender, terete, tough, reddish-brown or gray; buds small, acute; leaves ovate, acute, with serrate margins; staminate flowers in pendulous aments; stamens 3–20, subtended by acute, leathery scales that exceed them; pistillate flowers in terminal aments, in pairs, subtended by 3-lobed foliaceous bracts; fruit a nut, ovoid, acute, separating from the bracts when mature.

Carpinus is a genus of several species in the northern hemisphere. Only *C. caroliniana* Walt. is found in Illinois.

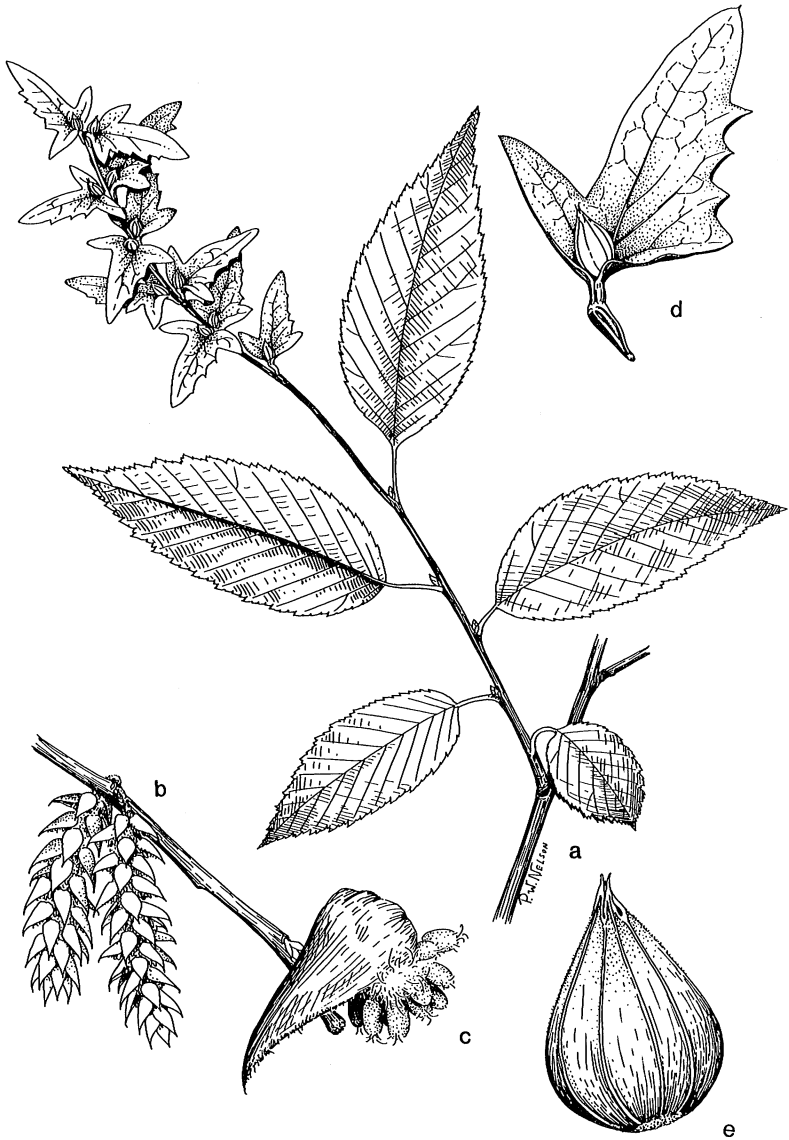
1. *Carpinus caroliniana* Walt. Fl. Carol. 236. 1788. Fig. 106.

Carpinus betulus virginiana Marsh. Arb. Am. 25. 1785.

Carpinus americana Michx. Fl. Bor. Am. 2:201. 1803.

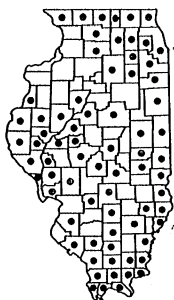
Carpinus caroliniana Walt. var. *virginiana* (Marsh) Fern. Rhodora 37:425. 1935.

Tree up to 12 m tall, to 2 dm in diameter, the crown open and rounded; bark thin, ashy-gray, fluted, marked with broad, dark stripes and appearing twisted; twigs reddish-brown, slender, terete, with a zigzag appearance; buds small, acute, chestnut-brown; leaves ovate-oblong, thin, acute at the apex, doubly serrate, glabrous except for tufts of hairs in the vein axils, up to 12 cm long; petioles short, slender, hairy, terete; staminate flowers in aments up to 5 cm long, the flowers subtended by broadly ovate scales; pistillate flowers in aments up to 2 cm long, in pairs, subtended by



106. *Carpinus caroliniana* (Blue Beech; American Hornbeam; Ironwood; Muscle Wood). *a*. Leafy branch with fruits, $\times 1$. *b*. Branch with staminate catkins, $\times 2$. *c*. Staminate flower, $\times 10$. *d*. Fruit with lobed bract, $\times 3$. *e*. Nut, $\times 10$.

ovate, acute scales; fruit a nut, ovoid, to 8 mm long, subtended by a 3-lobed, foliaceous bract.



COMMON NAMES: Blue Beech; American Hornbeam; Ironwood; Muscle Wood.

HABITAT: Moist woods.

RANGE: Nova Scotia across to central Minnesota, south to eastern Oklahoma and east Texas, east to central Florida.

ILLINOIS DISTRIBUTION: Throughout the state; doubtless in every county.

Blue Beech is a contributor to the understory of Illinois forests. While it is common throughout the state, it is rarely found in large numbers. In leaf it resembles the beech, elms, and hop hornbeam. It may be distinguished from beech by shorter buds, more teeth per leaf, and a fluted bark. Hop hornbeam has a flaky bark, and the elms have asymmetrical leaf bases.

The wood of blue beech is heavy, tough, and durable, but like hop hornbeam, the tree does not achieve a size that makes harvesting the trees commercially practicable. Its wood has been used in making tool handles.

The species has also been called muscle wood. This is in reference to the appearance of the trunk, which is spiraled with round, low, broad ridges that resemble twisted muscle.

I have reserved recognition of varieties of this species until such time as the differences attributed to them can be shown to have ecological significance. For those who may choose to distinguish them, Illinois material is referable to var. *virginiana*.

During the nineteenth century, most Illinois botanists referred to this species as *C. americana* Michx., but Willdenow's *C. caroliniana* clearly is earlier than Michaux' epithet.

Flowers bloom in April and May.

Species Excluded

Alnus incana (L.) Moench. This binomial belongs to the white alder, a European tree that sometimes is grown in Illinois as an ornamental but which apparently has not escaped. Several Illinois botanists have used this binomial incorrectly for the native *Alnus rugosa* (DuRoi) Spreng.

Betula lenta L. The sweet birch is native to the east of Illinois. Its binomial has been erroneously applied in the past in Illinois to both *B. alleghaniensis* Britt. and *B. nigra* L.

Castanea pumila (L.) Mill. Ridgway used this binomial of the chinquapin for the chinquapin oak, *Q. prinoides* Willd. var. *acuminata* (Michx. f.) G1. *Castanea pumila* does not occur in Illinois.

Castanea sativa Mill. Reports of the Spanish chestnut from Illinois are apparently based on cultivated specimens.

Polygonum cilinode Michx. The range of this species lies north and east of Illinois. It has erroneously been attributed to this state.

Polygonum gracile Nutt. This binomial was applied incorrectly in the past to some Illinois specimens of *P. ramosissimum*.

Polygonum tomentosum Schrank. Although plants referred to in this book as *P. scabrum* Moench have been called *P. tomentosum* in the past, I regard *P. tomentosum* as a totally different species that does not occur in Illinois.

Quercus nigra L. This binomial was used by most Illinois botanists during the nineteenth century for *Q. marilandica* Muenchh. There is, however, in the herbarium of the University of Illinois an authentic specimen of *Quercus nigra* from Hallock Scherer's farm in Wabash County, collected in 1918. There is no indication whether the collection is from a cultivated plant, but other specimens from Scherer's farm in the University of Illinois herbarium are of native plants. Since *Q. nigra* is to be expected in Illinois, a thorough search of the woods around the old Scherer farm is needed.

Quercus texana Buckl. A few botanists have erroneously applied this binomial to *Q. shumardii* in Illinois.

Rumex acetosa L. Early reports of this European species from Illinois are in error for *R. acetosella* L.

Rumex britannica L. Most botanists in Illinois prior to 1950 used this binomial for *R. orbiculatus* Gray. *Rumex britannica* is a different species not known from the state.

Rumex conglomeratus Murr. No specimens of this species could be found to verify its prior or present distribution in Illinois.

Rumex hydrolapathum Huds. Although this species does not occur in Illinois, its binominal has mistakenly been used for *R. orbiculatus* Gray.

Rumex sanguineus L. A few Illinois botanists have confused this species with *R. obtusifolius*. *Rumex sanguineus* does not occur in Illinois.

APPENDIX: ADDITIONS AND CHANGES
TO THE FIRST EDITION
SUMMARY OF THE TAXA TREATED IN
THIS VOLUME
GLOSSARY
LITERATURE CITED
INDEX OF PLANT NAMES

APPENDIX: ADDITIONS AND CHANGES TO THE FIRST EDITION

Since publication of the first edition of *Smartweeds to Hazelnuts* in 1987, several additions to the flora of Illinois in the families covered by this book have been made, and many new distributional records have been added. Also, many nomenclatural revisions have taken place, resulting in numerous alterations of the scientific names. All of these changes are reflected in the entries below.

Page 5. After years of observations and study, I have come to the conclusion that the genus *Polygonum* consists of several groups of species, each of which should be recognized at the generic level. Therefore, a new key to the genera of Polygonaceae in Illinois is provided to reflect these changes.

1. Climbing shrubs with tendrils; pedicels winged on 1 side by the calyx ____
 ----- *Brunnichia*
1. Prostrate, ascending, or erect herbs or, if climbing, not woody and without
 tendrils; pedicels not winged by the calyx.
 2. Leaves very narrow, needlelike ----- *Polygonella*
 2. Leaves linear or broader, not needlelike.
 3. Sepals 6; stamens 6.
 4. All sepals similar; fruit 3-winged ----- *Rheum*
 4. Outer sepals narrower than inner sepals; fruit 3-angled ____ *Rumex*
 3. Sepals usually 5; stamens 3-8.
 5. Stems retrorse prickly.
 6. Leaves tapering to base ----- *Persicaria*
 6. Leaves hastate or sagittate ----- *Tracaulon*
 5. Stems not retrorse prickly.
 7. Leaves hastate-deltoid ----- *Fagopyrum*
 7. Leaves not hastate-deltoid.
 8. Stems twining or trailing, neither erect nor prostrate -----
 ----- *Fallopia*
 8. Stems erect or prostrate, neither twining nor climbing.
 9. Flowers borne in small axillary clusters ----- *Polygonum*
 9. Flowers borne in terminal and/or axillary spikes or racemes.

- 10. Outer sepals broadly winged; plants bushy, more than 1 m tall _____ *Reynoutria*
- 10. Outer sepals unwinged; plants not bushy, often less than tall.
- 11. Style persistent as a beak on the achene; calyx usually 4-parted _____ *Antenoron*
- 11. Style deciduous; calyx usually 5-parted _____
 _____ *Persicaria*

Page 6. *Brunnichia ovata* (Walt.) Shinn. Add the following county to the map on page 8: Richland. This record is from an adventive non-native source.

Page 8. *Polygonella articulata* (L.) Meisn. There are no new records for this species.

Page 10. *Rheum raponticum* L. The correct binomial for this species appears to be **Rheum rhabarbarum**. Its taxonomy follows:

Rheum rhabarbarum L. Sp. Pl. 1:372. 1753.

Rheum raponticum L. Sp.Pl. 1:372. 1753.

There are no new records for this species. The illustrations for this species on pages 11 and 12 should be relabeled *Rheum rhabarbarum*.

Page 13. *Rumex* L. With the addition of three species of *Rumex* and three name changes, a new key to *Rumex* in Illinois is provided:

- 1. Some of the leaves hastate (rarely entire in 1 form of *R. acetosella*); plants dioecious.
 - 2. Plants with stolons or slender rhizomes; achenes exserted from the calyx _____ *R. acetosella*
 - 2. Plants with a taproot; achenes enclosed by the calyx _____ *R. hastatulus*
- 1. None of the leaves hastate; plants monoecious.
 - 3. All fruiting valves lacking tubercles _____ *R. longifolius*
 - 3. At least one of the fruiting valves with a tubercle.
 - 4. Fruiting valves with spinulose bristles or conspicuously dentate.
 - 5. Fruiting valves with spinulose bristles.
 - 6. Stems hollow; tubercle of fruit long and slender; bristles of fruiting sepals longer than width of the sepal _____ *R. fueginus*
 - 6. Stems firm; tubercle of fruit only slightly longer than broad; bristles of fruiting sepals not longer than width of the sepals _____
 _____ *R. obtusifolius*

5. Fruiting valves conspicuously dentate.
 7. Teeth of fruiting valves broad, 4–5 mm long; leaves flat or slightly undulate _____ *R. dentatus*
 7. Teeth of fruiting valves narrow, less than 4 mm long; leaves conspicuously crispate _____ *R. stenophyllus*
4. Fruiting valves either entire or only minutely toothed or erose.
 8. Valves about as wide as the face of the achene; fruit not appearing 3-winged _____ *R. conglomeratus*
 8. Valves much wider than the face of the achene; fruit appearing 3-winged.
 9. Only 1 of the 3 fruiting valves with a tubercle.
 10. Some of the leaves over 10 cm wide; each fruiting valve 8–10 mm broad _____ *R. patientia*
 10. None of the leaves 10 cm wide; each fruiting valve up to 6 mm broad.
 11. Leaves crispate along the margin _____ *R. crispus*
 11. Leaves flat _____ *R. altissimus*
 9. Each of the fruiting valves with a tubercle.
 12. Leaves with conspicuous crispate and undulate margins _____ *R. crispus*
 12. Leaves flat, entire to crenulate
 13. Leaves crenulate; lateral veins of leaves forming right angles with the vertical veins _____ *R. britannica*
 13. Leaves entire; lateral veins of leaves ascending.
 14. Pedicels of fruits 2–5 times longer than the calyx _____ *R. verticillatus*
 14. Pedicels of fruits shorter than to about twice as long as the calyx.
 15. Pedicels 1 ½-2 times longer than the calyx; achenes 3.0–3.2 mm long _____ *R. cristatus*
 15. Pedicels shorter than or equaling the calyx; achenes 1.5–2.8 mm long.
 16. Leaves narrowly lanceolate, never more than 3 cm wide _____ *R. triangulivalvis*
 16. Leaves broadly lanceolate, at least some of them more than 3 mm wide _____ *R. altissimus*

Page 15. *Rumex hastatulus* Baldw. There are no new records for this species.

Page 19. *Rumex longifolius* DC. There are no new records for this species.

Page 19. *Rumex maritimus* L. var. *fueginus* (Phil.) Dusen. *Rumex maritimus* is an entirely different plant not known from Illinois. Variety *fueginus* is elevated to the rank of species. Its taxonomy follows:

Rumex fueginus Phil. Anal. Univ. Chile 91:493. 1895.

Rumex maritimus L. var. *fueginus* (Phil.) Dusen, Sv. Exped. Magell. 3, no. 5:194. 1900.

The following county should be added to the distribution map on page 22: Madison. The illustration for this species on page 21 should be *Rumex fueginus*.

Page 22. *Rumex obtusifolius* L. The following counties should be added to the distribution map on page 24 (top): Carroll, DeKalb, Fayette, Knox, Rock Island, Warren, Washington, Williamson.

Page 25. *Rumex patientia* L. The following counties should be added to the distribution map on page 24 (bottom): Alexander, DeWitt, Monroe, Randolph.

Page 27. *Rumex crispus* L. The following counties should be added to the distribution map on page 27: Brown, Clark, Clay, Crawford, Jersey, Wayne, Whiteside.

Page 27. *Rumex altissimus* Wood. The following counties should be added to the distribution map on page 31: Edgar, Jasper, Jersey, Johnson, Pulaski, Rock Island.

Page 31. *Rumex orbiculatus* Gray. This species should be called **Rumex britannica**. Its taxonomy follows:

Rumex britannica L. Sp. Pl. 1:334. 1753.

Rumex orbiculatus Gray, Man. Bot., ed. 5, 420. 1867.

The following counties should be added to the distribution map on page 33 (top): Iroquois, Lee. The illustration for this species on page 32 should be *Rumex britannica*.

Page 33. *Rumex verticillatus* L. The following counties should be added to the distribution map on page 33 (bottom): Bond, Carroll, Jasper, Iroquois, McHenry, Saline, Williamson.

Page 34. *Rumex mexicanus* Meisn. in DC. Apparently the correct binomial for this species is *Rumex triangulivalvis*. Its taxonomy follows:

Rumex triangulivalvis (Danser) Rech. f. Rep. Sp. Nov. 40:297. 1936.

Rumex mexicanus Meisn. in DC. Prodr. 14:45. 1856, misapplied.

Rumex salicifolius Weinmann ssp. *triangulivalvis* Danser, Ned. Kruidk. Arch. 1925:415.

1926.

There are no new records for this species. The illustration for this species on page 36 should be *Rumex triangulivalvis*.

Page 35. *Rumex cristatus* DC. There are no new records for this species.

After *Rumex cristatus*, add the following species found new in Illinois since the first edition:



A1. *Rumex conglomeratus* (Clustered green dock). Upper part of plant with leaves and fruits (center). Fruit (upper left). Staminate flower (above center). Pistillate flower (above right). Leaf (lower right).

Rumex conglomeratus Murray, Prodr. Stirp. Gott. 52. 1770. Fig. A1.

Perennial herbs from thickened roots; stems erect, branched, glabrous, to 1 m tall; leaves oblong-lanceolate to lanceolate, obtuse to acute at the apex, tapering, rounded, or subcordate at the base, to 30 cm long, to 6 cm wide, glabrous, entire, the petioles about $\frac{1}{4}$ – $\frac{1}{3}$ the length of the blade; inflorescence paniculate, terminal, interrupted, with occasional leaflike bracts; flowers perfect or unisexual, on pedicels up to 4 mm long, the pedicels distinctly swollen; valves oblong, 2–3 mm long, veiny, entire along the margins; tubercles 3, usually unequal in size, narrowly ellipsoid; achenes dark reddish brown, 1.5–2.0 mm long, smooth, shiny, angular. June–September.

COMMON NAME: Clustered green dock.

HABITAT: Wet disturbed areas in Illinois.

RANGE: Native to Europe, Asia, and Africa; Massachusetts to Illinois, south to Texas and Georgia; also British Columbia south to Arizona.

ILLINOIS DISTRIBUTION: Cook and DuPage counties.

This species most nearly resembles *R. cristatus*, but the sepals in *R. conglomeratus* are oblong and the valves of the fruit are entire, while in *R. cristatus*, the sepals are deltoid and the valves of the fruit are irregularly toothed.

Rumex dentatus L. Mant. Pl. 226. 1771. Fig. A2.

Annual or biennial herbs from thickened roots; stems erect, branched, glabrous, to 75 cm tall; leaves oblong to narrowly ovate, obtuse to acute at the apex, truncate or subcordate at the base, to 10 cm long, to 5 cm wide, entire or sometimes shallowly undulate, glabrous, on petioles up to $\frac{1}{3}$ as long as the blade; inflorescence sometimes occupying as much as half the length of the plant, interrupted; flowers perfect, on filiform, jointed pedicels to 5 mm long; valves of the fruit ovate to deltate, 3–6 mm long, 2–3 mm wide, distinctly dentate; tubercles (1-) 3, equal or unequal in size, narrowly ellipsoid; achenes dark reddish brown, 2–3 mm long. May–September.

COMMON NAME: Toothed dock.

HABITAT: Disturbed areas.



A2. *Rumex dentatus* (Toothed dock). Upper part of plant with leaves, flowers, and fruits (center). Fruit (upper right). Seed (lower right).

RANGE: Native to Europe, Asia, and Africa; scattered in the United States.

ILLINOIS DISTRIBUTION: Cook and St. Clair counties.

The oblong to narrowly ovate leaves with truncate or subcordate bases and the strongly toothed valves of the fruit distinguish this species.

Rumex stenophyllus Ledeb. Fl. Altaica 2:58. 1830. Fig. A3.

Rumex crispus L. var. *dentatus* Schur, Enum. Pl. Transsilv. 580. 1866.

Perennial herbs from thickened rootstocks; stems erect, branched, glabrous, to nearly 1 m tall; leaves narrowly lanceolate to oblong-lanceolate, obtuse to acute at the apex, tapering or truncate at the base, to 25 cm long, to 7 cm wide, entire or denticulate, crispate, rarely flat, glabrous above, obscurely papillose on the veins below, the petioles ½ to nearly as long as the blades; inflorescence sometimes occupying as much as half of the length of the plant, terminal, densely flowered except near the base; flowers whorled, on filiform pedicels up to 8 mm long, the pedicels with swollen joints; valves of the fruit orbicular to deltate, dentate, 3.5–5.0 mm long, about as wide; tubercles 3, more or less equal in size; achenes reddish brown to dark brown, 2–3 mm long, 1.0–1.5 mm wide. May–September.

COMMON NAME: Narrow-leaved curly dock.

HABITAT: Wet disturbed areas.

RANGE: Native to Europe and Asia; Quebec to Alberta to Oregon, south to California, New Mexico, Oklahoma, Missouri, and Illinois; also South Carolina.

ILLINOIS DISTRIBUTION: Known only from St. Clair County.

Page 37. *Fagopyrum esculentum* Moench. The following county should be added to the distribution map on page 39: Kendall.

Page 39. *Polygonum* L. From about 1935 until the present, the genus *Polygonum* was circumscribed to include many diverse plants, all held together by the characteristic of having sheaths, called ocreae, surrounding the stem above the attachment of the leaves. The genus was generally divided into several clear-cut sections. Prior to 1935, however, American botanists such as John K. Small, Per Axel Rydberg, Nathaniel Lord Britton, Edmund Greene, and a few others, elevated most of these sections to the rank of genus.

Since around 1960, having observed and studied *Polygonum* exten-



A3. *Rumex stenophyllus* (Narrow-leaved curly dock). Branchlet with flowers (left). Branchlet with fruit (right). Fruit with tubercle (below).

sively in the field, I came to the conclusion that Small, Rydberg, *et al.* had the more correct concept of the genus. In 2002, when I published the third edition of *Vascular Flora of Illinois*, I divided the traditional *Polygonum* into several genera. More recent sophisticated biochemical and genetical studies appear to bear out the dividing of *Polygonum* into various genera.

In this work, I recognize six genera instead of the all-inclusive *Polygonum*. This, of course, has resulted in massive nomenclatural changes which are chronicled below.

Following is a key to the genera that have been carved out of *Polygonum* in Illinois:

- I. Stems retrorse prickly.
 - 2. Leaves hastate or sagittate; plants scandent _____ *Tracaulon*
 - 2. Leaves tapering to base; plants not scandent _____ *Persicaria*
- I. Stems not retrorse prickly.
 - 3. Stems twining or trailing, neither erect nor prostrate _____ *Fallopia*
 - 3. Stems erect or prostrate, neither twining nor trailing.
 - 4. Flowers borne in small, axillary clusters _____ *Polygonum*
 - 4. Flowers borne in terminal and/or axillary spikes or racemes.
 - 5. Outer sepals broadly winged; plants bushy, more than 1 m tall _____
_____ *Reynoutria*
 - 5. Outer sepals unwinged; plants not bushy, often less than 1 m tall.
 - 6. Style persistent as a beak on the achene; calyx usually 4-parted _____
_____ *Antenoron*
 - 6. Style deciduous; calyx usually 5-parted _____ *Persicaria*

Pages 44 and 46. *Polygonum sagittatum* L. and *P. arifolium* L. are now in the genus *Tracaulon*. The taxonomy of *Tracaulon* and its two species in Illinois follows:

Tracaulon Raf.— Tear-thumb

Scandent or sprawling annual or perennial herbs; stems retrorse prickly, 4-angled, climbing or reclining on other vegetation; leaves alternate, simple, acute or acuminate at the apex, hastate or sagittate at the base, prickly at least on the veins below, the upper leaves often sessile, the lower ones petiolate, the petioles retrorse prickly; ocreae oblique, prickly at least near the base; inflorescence of dense terminal and/or axillary heads or

short racemes, the branches retrorse prickly; calyx 5-parted, the sepals pink to whitish to greenish; styles 2- or 3-parted; stamens 6 or 8; achenes trigonous or lenticular, smooth, shiny.

Approximately 15 species comprise the genus. It differs from others in the *Polygonum* complex by its scandent habit and its retrorse prickly herbage.

Page 44. *Polygonum sagittatum* L. This species is now known as **Tracaulon sagittatum**. Its taxonomy follows:

Tracaulon sagittatum (L.) Small, Fl. S. E. U. S. 3981. 1903.

Polygonum sagittatum L. Sp. Pl. 1:363. 1753.

Persicaria sagittata (L.) H. Gross, Beih. Bot. Cent. 37:113. 1919.

There are no new records for this species. The illustration for this species on page 45 should be *Tracaulon sagittatum*.

Page 46. *Polygonum arifolium* L. This species is now known as **Tracaulon arifolium**. Its taxonomy follows:

Tracaulon arifolium (L.) Raf. Fl. Tell. 3:13. 1836.

Polygonum arifolium L. Sp. Pl. 1:364. 1753.

Polygonum sagittatum L. var. *pubescens* Keller, Bull. Soc. Royo. Bot. Belg. 30:45. 1891.

Polygonum arifolium L. var. *lentiforme* Fern. & Griseb. Rhodora 37:167. 1935.

Polygonum arifolium L. var. *pubescens* (Keller) Fern. Rhodora 48:53. 1946.

Persicaria arifolia (L.) Haraldson, Acta Univ. Upsal. Sumb. Bot. Upsal. 22:72. 1978.

The following counties should be added to the distribution map on page 48 (top): Jasper, Lawrence. The illustration for this species on page 45 should be *Tracaulon arifolium*.

Page 48. *Polygonum convolvulus* L. This species as well as those on pages 50 and 52 are now in the genus **Fallopia**. In addition, two additional species of *Fallopia* are now in the Illinois flora. The taxonomy of the genus *Fallopia* follows:

Fallopia Adans.—Climbing Buckwheat

Annual or perennial herbaceous vines; leaves alternate, simple, entire, with an ocrea at the base, the petioles jointed; inflorescence axillary, of

spikelike racemes; flowers perfect, actinomorphic, pedicellate; calyx 5-parted, white to greenish or pinkish, the outer 3 segments winged or keeled and larger than the inner 2 segments; stamens 8; style 3-cleft; stigmas capitate; achenes trigonous, included or exerted beyond the perianth, smooth, dull or shiny.

Approximately nine species comprise this genus which is often included within the genus *Polygonum*. The species of *Fallopia* differ from other genera in the *Polygonum* complex by its herbaceous viny habit and the absence of retrorse prickly herbage.

- 1. Base of ocreal sheaths with bristles and reflexed hairs _____ *F. cilinodis*
- 1. Base of ocreal sheaths glabrous or scabrous.
 - 2. Achenes dull, granular; outer sepals keeled _____ *F. convolvulus*
 - 2. Achenes shiny, smooth; outer sepals winged.
 - 3. Wings of fruit decurrent on a stipelike base, usually not flat, the margins of the wings crenulate to toothed.
 - 4. Calyx in fruit up to 10 mm long; achenes up to 3 mm long *F. cristata*
 - 4. Calyx in fruit more than 10 mm long; achenes more than 3 mm long
 _____ *F. scandens*
 - 3. Wings of fruit truncate at base, usually flat, the margins of the wings usually entire _____ *F. dumetorum*

Page 48. *Polygonum convolvulus* L. This species is now in the genus *Fallopia*. Its taxonomy follows:

Fallopia convolvulus (L.) A. Love, Taxon 29:300. 1970.

Polygonum convolvulus L. Sp. Pl. 1:364. 1753.

Bilderdykia convolvulus (L.) Dumortier, Fl. Belg. 18. 1827.

Tiniaria convolvulus (L.) Webb & Moq. ex Webb & Benth. Hist. Nat. Iles Canaries 3:221. 1836–40.

Reynoutria convolvulus (L.) Shinnors, Sida 3:117. 1967.

There are no new records for this species.

Page 50. *Polygonum cristatum* Engelm. & Gray. This species is now in the genus *Fallopia*. Its taxonomy follows:

Fallopia cristata (Engelm. & Gray) Holub, Fol. Geobot. Phytotax. 6:176. 1971.

Polygonum cristatum Engelm. & Gray, Bot. Journ. Nat. Hist. 5:259. 1847.

Tiniaria cristata (Engelm. & Gray) Small, Fl. S. E. U. S. 382. 1903.

Bilderdykia cristata (Engelm. & Gray) Greene, Leaflets Bot. Obs. 1:23. 1904.

Reynoutria scandens (L.) Shinnars var. *cristata* (Engelm. & Gray) Shinnars, Sida 3:118. 1967.

Add the following county to the distribution map on page 50: Perry.

Page 52. *Polygonum scandens* L. This species is now in the genus *Fallopia*. Its taxonomy follows:



A4. *Fallopia cilinodis* (Bristly climbing buckwheat). Branchlet with leaves and flowers (center). Leaf and node (upper left). Flower (lower right).

Fallopia scandens (L.) Holub, Fol. Geobot. Phytotax. 6:176. 1971.

Polygonum scandens L. Sp. Pl. 1:364. 1753.

Tiniaria scandens (L.) Small, Fl. S. E. U. S. 382. 1903.

Bilderdykia scandens (L.) Greene, Leaflets Obs. 1:23. 1904.

Reynoutria scandens (L.) Shinnars, Sida 3:118. 1967.

There are no new records for this species.

After *Polygonum scandens* on page 52, add the following species of *Fallopia* that are new to Illinois:

Fallopia cilinodis (Michx.) Holub, Fol. Geobot. Phytotax. 6:176.

1971. Fig. A4.

Polygonum cilinode Michx. Fl. Bor. Am. 1:241. 1803.

Tiniaria cilinodis (Michx.) Small, Fl. S. E. U. S. 382. 1903.

Bilderdykia cilinode (Michx.) Greene, Leaflets Obs. 1:23. 1904.

Reynoutria cilinodis (Michx.) Shinnars, Sida 3:117. 1967.

Perennial herbs; stems twining, angled, branched, hispid, to 5 m long; leaves ovate to hastate to sagittate, acute to acuminate at the apex, cordate at the base, to 8 (-10) cm long, to 5 (-7) cm wide, ciliate, glabrous above, hispid below, the petioles to 5 cm long; ocreae oblique, with reflexed hairs and slender bristles; inflorescence of terminal and axillary racemes, the racemes to 10 cm long; calyx composed of 5 sepals in 2 series, the sepals white or greenish white, 1.5–2.0 mm long, enlarging in fruit; stamens 6–8; style 3-cleft; achenes trigonous, dark brown to black, shiny, smooth, 3–4 mm long, subtended by 3 winged sepals. June–October.

COMMON NAME: Bristly climbing buckwheat.

HABITAT: Edge of woods.

RANGE: Quebec to Manitoba, south to Minnesota, Illinois, Tennessee, and Georgia.

ILLINOIS DISTRIBUTION: Known only from Jackson County.

This is the only species of *Fallopia* that has ocreae with reflexed hairs and slender bristles.

Fallopia dumetorum (L.) Holub, Fol. Geobot. Phytotax. 6:176.

1971. Fig. A5.

Polygonum dumetorum L. Sp. Pl., ed. 2, 1:522. 1762.

Bilderdykia dumetora (L.) Dumort. Fl. Belg. 18. 1827.

Tiniaria dumetora (L.) Opiz, Seznam. Rostl. Kvet. Ceska 98. 1852.

Polygonum scandens L. var. *dumetorum* (L.) Gl. Phytologia 4:23. 1952.

Reynoutria scandens (L.) Shinnars var. *dumetorum* (L.) Shinnars, Sida 3:118. 1967.

Annual; stems twining, angled, branched, glabrous to scabrous, to 3 m long; leaves deltate to hastate, acute to acuminate at the apex, cordate or truncate at the base, to 6 (-8) cm long, to 4 (-5) cm wide, glabrous or



A5. *Fallopia dumetorum* (Climbing buckwheat). Habit in fruit (center). Fruit (upper left). Flower (lower left). Seed (right).

scabrous, the petioles to 2.5 cm long; ocreae oblique, without bristles; inflorescence of racemes from the axils of the leaves, the racemes to 20 cm long; calyx consisting of 5–6 sepals in 2 series, the sepals white or pale pink, 2.5–4.0 mm long, enlarging greatly in fruit; stamens 8; style 3-cleft; achenes trigonous, black, shiny, smooth, 2–4 mm long, subtended by the 3 outer flat winged sepals, the wings entire or less commonly undulate. June–October.

COMMON NAME: Climbing buckwheat.

HABITAT: Thickets, edge of woods.

RANGE: Quebec to Wisconsin, south to Texas and Illinois.

ILLINOIS DISTRIBUTION: Scattered in a few counties, mostly on the western side of the state.

The flat, entire wings of the mature fruits distinguish this species from others in the genus.

Pages 54 through 69 (following *Polygonum neglectum*). These species remain in the genus *Polygonum*. Since two additional species of *Polygonum* are new to Illinois, a new key is provided below:

- 1. Leaves plicate; stems angular _____ *P. tenue*
- 1. Leaves flat; stems terete or nearly so.
 - 2. Achenes usually included and enclosed by the perianth.
 - 3. Plants erect, not mat-forming.
 - 4. Leaves linear to lanceolate, to 10 mm wide, at least 4 times longer than wide; achenes shiny, more or less smooth _____ *P. ramosissimum*
 - 4. Leaves elliptic to oval, 10–30 mm wide, less than 4 times longer than wide; achenes dull, striate or punctate _____ *P. erectum*
 - 3. Plants mat-forming, with some of the stems often ultimately ascending.
 - 5. Leaves all similar in shape and size; achenes shiny, 2.0–2.5 (–2.8) mm long.
 - 6. Leaves obtuse at apex, gray-green; ocreae red-brown; achenes light brown to brown _____ *P. buxiforme*
 - 6. Leaves acute at apex, green to blue-green; ocreae silvery; achenes dark brown _____ *P. arenastrum*
 - 5. Upper leaves conspicuously smaller and narrower than lower leaves; achenes dull, 2.5–3.0 mm long _____ *P. aviculare*
 - 2. Achenes usually exerted beyond the tips of the perianth.
 - 7. Plants mat-forming, with some of the stems often ascending at maturity _____ *P. arenastrum*

7. Plants ascending to erect, not mat-forming.
8. Leaves obtuse at apex, the largest ones 8–15 mm wide _____
 _____ *P. achoreum*
8. Leaves acute at apex, the largest ones up to 8 mm wide.
9. Leaves cuspidate at tip; achenes long-exserted beyond the perianth, the achenes 4–6 mm long _____ *P. exsertum*
9. Leaves not cuspidate at tip; achenes exserted, but not greatly so, the achenes up to 4 mm long.
10. All leaves similar in size and shape; achenes shiny, black; sepals up to 2 mm long _____ *P. prolificum*
10. Upper leaves smaller and narrower than lower leaves; achenes dull, brown to dark brown (sometimes nearly black in *P. rurivagum*); sepals 2–3 mm long.
11. Achenes striate and tuberculate; leaves blue-green _____
 _____ *P. patulum*
11. Achenes striate or minutely punctate, not tuberculate; leaves green.
12. Achenes striate, 2.5–4.0 mm long, dark brown to black; ocreae veiny _____ *P. rurivagum*
12. Achenes minutely punctate, 2–3 mm long, brown; ocreae reddish brown _____ *P. neglectum*

Page 54. *Polygonum tenue* Michx. The following county should be added to the distribution map on page 54: Jasper.

Page 54. *Polygonum aviculare* L. The following county should be added to the distribution map on page 56 (top): Alexander.

Page 57. *Polygonum buxiforme* Small. The following counties should be added to the distribution map on page 57 (bottom): Coles, Kankakee, LaSalle, Marion.

The following synonym should be added to the taxonomy of *P. buxiforme* on page 57:

Polygonum aviculare L. ssp. *buxiforme* (Small) Costea & Tardif, Sida 20:988. 2003.

Page 57. *Polygonum prolificum* (Small) Robins. There are no new records for this species.

The following synonym should be added to the taxonomy of *P. prolificum* on page 57:

Polygonum ramosissimum Michx. ssp. *prolificum* (Small) Costa & Tardif, Sida 20:995. 2003.

Page 60. *Polygonum exsertum* Small. There are no new records for this species.

Page 62. *Polygonum ramosissimum* Michx. There are no new records for this species.

Page 64. *Polygonum erectum* L. There are no new records for this species.

Page 64. *Polygonum achoreum* Blake. The following county should be added to the distribution map on page 67 (top): Iroquois.

Page 67. *Polygonum arenastrum* Bor. There are no new records for this species.

The following synonyms should be added to the taxonomy of *Polygonum arenastrum* on page 67:

Polygonum aviculare L. var. *depressum* Meisn. in DC. Prodr. 14:98. 1856.

Polygonum aviculare L. ssp. *depressum* (Meisn.) Arcangeli, Comp. Fl. Ital. 583. 1882.

Page 69. *Polygonum neglectum* Besser. The following counties should be added to the distribution map on page 69: Monroe, St. Clair.

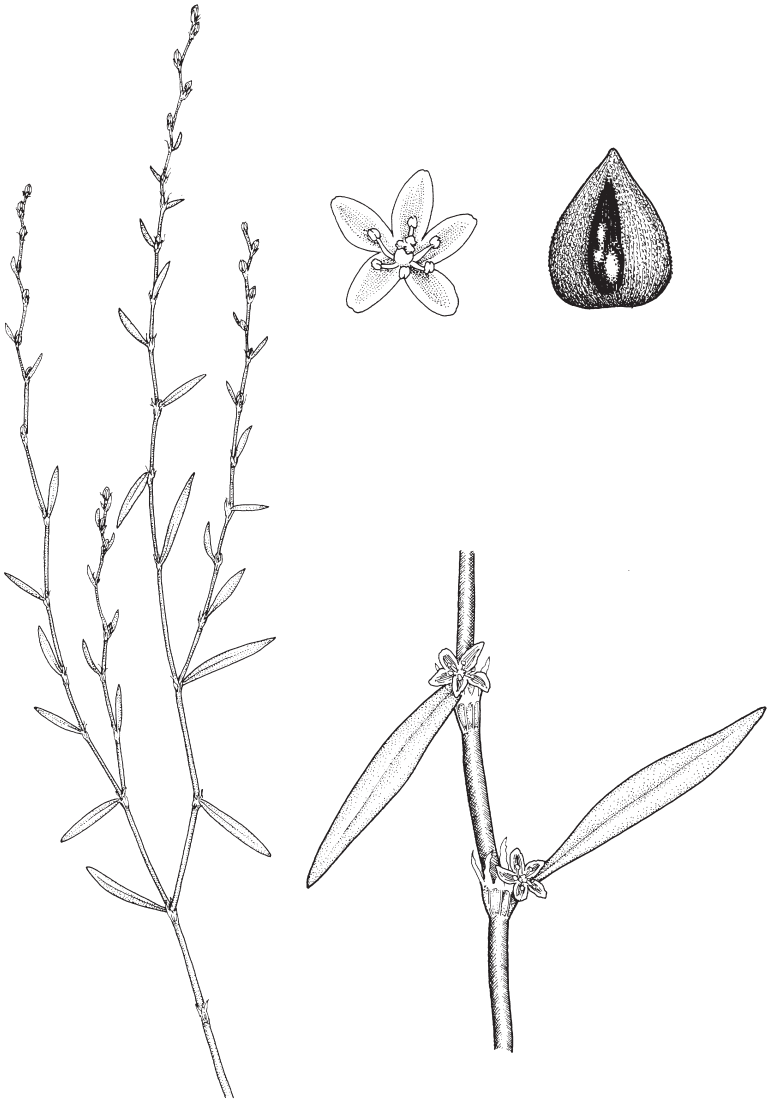
The following synonym should be added to the taxonomy of *P. neglectum* on page 69:

Polygonum aviculare L. ssp. *neglectum* (Besser) Arcangeli, Comp. Fl. Ital. 583. 1882.

Page 69. After *Polygonum neglectum*, the following species which are new to Illinois should be added:

Polygonum patulum M. Bieberstein, Fl. Taur.-Caucas. 1:304. 1808. Fig A6.

Annual herbs from a slender taproot; stems ascending to erect, branched, glabrous, to 75 cm tall; leaves linear to lanceolate, acute at the apex, tapering to the base, green or blue-green, to 4 cm long, to 8 mm wide, the uppermost leaves strongly reduced, sessile or with petioles to 1 mm long; ocreae fibrous at the tip; inflorescence axillary and/or terminal, spikelike; flowers sessile or with pedicels up to 2 mm long; calyx 5-parted, the sepals green with a pinkish tinge, 2.5–3.0 mm long, cucullate; petals absent; stamens 8; achenes trigonous, ovoid, acute at the apex, brown, dull, striate and tuberculate, 2.0–2.5 (–4.0) mm long, exserted from the perianth. July–October.



A6. *Polygonum patulum* (Tuberled knotweed). Habit (left). Flower (upper center). Seed (upper right). Nodes with flowers and leaves (lower right).

COMMON NAME: Tubercled knotweed.

HABITAT: Disturbed areas.

RANGE: Native to Eurasia and Africa; adventive in Alabama, Illinois, and Washington.

ILLINOIS DISTRIBUTION: Known from St. Clair County.

This species, rarely adventive in the United States, resembles *P. ramosissimum* because of its cucullate sepals, but differs from *P. ramosissimum* by its tuberculate achenes that are exserted beyond the perianth. It differs from *P. prolificum* by its tuberculate achenes.

Polygonum rurivagum Jordan ex Bor. Fl. Cenete. France, ed. 3, 2:560. 1857. Fig A7.

Polygonum aviculare L. ssp. *rurivagum* (Jordan ex Bor.) Berher, Fl. Vosges 195. 1887.

Annual herbs from a slender taproot; stems procumbent to ascending, branched, glabrous, to 40 cm tall; leaves linear-lanceolate to elliptic-lanceolate, acute at the apex, tapering to the base, entire, green, to 2.5 cm long, to 5 (–6) mm wide, subsessile or on petioles to 2 mm long, the upper leaves smaller and narrower than the lower leaves; ocreae conspicuously veiny, fibrous at the tip; inflorescence axillary, with 1–3 flowers per axil, on pedicels to 3 mm long; calyx 5-parted, green with a pinkish tinge, 2.2–3.0 mm long; stamens 7–8; achenes trigonous, ovoid, dark brown to black, dull, striate, 2.5–4.0 mm long, exserted from the perianth. July–October.

COMMON NAME: Narrow-leaved knotweed.

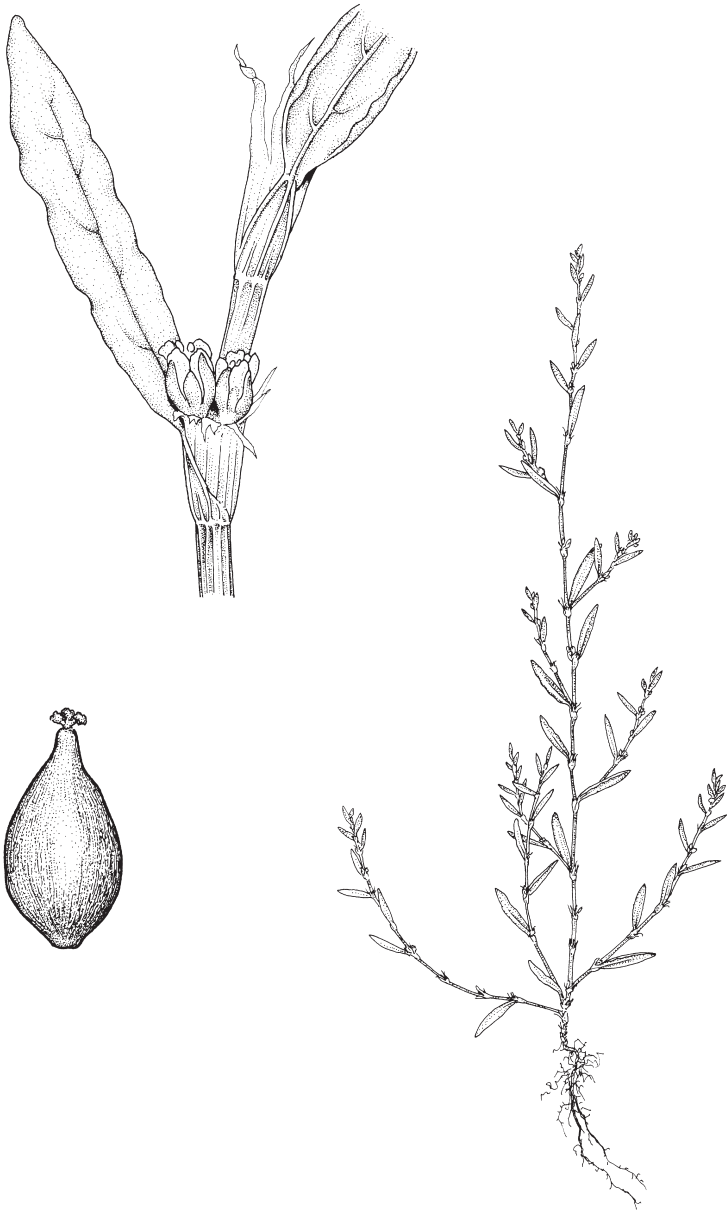
HABITAT: Disturbed areas.

RANGE: Native to Europe; adventive in the northern half of North America.

ILLINOIS DISTRIBUTION: Jackson County.

This species differs from *P. aviculare*, *P. arenastrum*, *P. neglectum*, and *P. buxiforme* by its slightly larger achenes and its veiny ocreae.

Some recent studies have suggested that because *P. aviculare*, *arenastrum*, *P. neglectum*, *P. buxiforme*, and *P. rurivagum* tend to cross and intergrade with each other that they are indistinguishable and should be considered subspecies of *P. aviculare*. Having studied this group in the field intensively since 1980, I am able to assign most specimens I encounter to one or another of the above five species. Therefore, I accord species rank to them.



A7. *Polygonum rurivagum* (Narrow-leaved knotweed). Habit (right). Nodes with flowers (upper left). Seed (lower left).

Page 69. *Polygonum sachalinense* F. Schmidt . The following counties should be added to the distribution map on page 72 (top): Champaign, Vermilion. This species and the one on page 72 are now in the genus *Reynoutria*. The taxonomy of the genus follows:

Reynoutria Houtt.—Giant Knotweed

Robust dioecious perennials from stout rhizomes; stems woody below, erect, branched; leaves alternate, simple, ovate, acute to acuminate at the apex, cordate or truncate at the base, entire to undulate, petiolate; ocreae oblique, caducous; inflorescence a cluster of axillary racemes; flowers unisexual, pedicellate; calyx 5-parted, the sepals green or greenish white; petals absent; stamens 8; style 3-cleft; achenes trigonous, smooth, shiny, enclosed by the persistent perianth.

This genus consists of two species and one hybrid. All of these are included within the genus *Fallopia* by some botanists, but lumping this genus with *Fallopia* is like combining the disparate *Schoenoplectus* and *Scirpus* in the Cyperaceae. This group is also sometimes included within *Polygonum sensu lato*. Since a hybrid is now known from Illinois, a new key is provided to *Reynoutria* in Illinois:

- I. Hairs on the veins of the leaves multicellular; base of leaves cordate _____
 _____ *R. sachalinensis*
- I. Hairs on the veins of the leaves unicellular, or veins glabrous or scabrous; base of leaves cordate or truncate.
 - 2. Veins of the leaves glabrous or scabrous; base of leaves truncate _____
 _____ *R. japonica*
 - 2. Hairs on the veins of the leaves unicellular; base of leaves cordate _____
 _____ *R. X bohemica*

Polygonum sachalinense is now *Reynoutria sachalinensis*, its taxonomy follows:

Reynoutria sachalinensis (F. Schmidt) Nakai, Enum. Pl. Corea 135. 1922.

Polygonum sachalinense F. Schmidt, Mem. Acad. Imp. St.-Petersb. 9:233. 1859.

Fallopia sachalinensis (F. Schmidt ex Maxim) Ronse Decraene, Bot. Journ. Linn. Soc.

98:369. 1988.

The illustration for this species on page 71 should be *Reynoutria sachalinensis*.

Page 72. *Polygonum cuspidatum* Sieb. & Zucc. The following counties should be added to the distribution map on page 72 (bottom): Monroe, Shelby. This species is now in the genus *Reynoutria* and is called *R. japonica*. Its taxonomy follows:

Reynoutria japonica Houtt. Nat. Hist. 2:640. 1777.

Polygonum cuspidatum Sieb. & Zucc. Fl. Jap. Fam. Nat. 2:84. 1846.

Fallopia japonica (Houtt.) Ronse Decraene, Bot. Journ. Linn. Soc. 98:369. 1988.



A8. *Reynoutria X bohemica* (Bohemian knotweed). Leafy branch with inflorescences (center). Glandular stem with fruit (upper right). Seed (upper center). Flower (lower left).

The illustration for this species on page 73 should be *Reynoutria japonica*.

The following hybrid between *R. sachalinensis* and *R. japonica* is new to Illinois:

Reynoutria X bohémica Chrtek & Chrtkova, Cas. Nar. Muz.

Praze Rada Prir. 152:120. 1983. Fig A8.

Fallopia X bohémica (Chrtek & Chrtkova) J. P. Bailey, Watsonia 17:443. 1989.

Polygonum X bohémicum (Chrtek & Chrtkova) Zika & Jacobson, Rhodora 105:144. 2003.

Robust dioecious perennial from stout rhizomes; stems woody below, erect, glabrous with very short unicellular hairs near the base, much branched, not angular, to 2.5 m tall; leaves simple, alternate, ovate, acute to acuminate at the apex, mostly cordate at the base, entire, glabrous or scabrous on the veins below, to 25 cm long, to 10 cm wide, petiolate; ocreae oblique, glabrous or puberulent; inflorescence a cluster of racemes from the axils of the upper leaves; flowers perfect or pistillate, pedicellate; calyx 5-parted, white to greenish white to pink; petals absent; stamens 8; style 3-cleft; achenes trigonous, dark brown, shiny, smooth, 2.5–3.2 mm long, enclosed by the persistent perianth. July–September.

COMMON NAME: Bohemian knotweed.

HABITAT: Disturbed areas.

RANGE: Native to Europe; adventive in various parts of the United States.

ILLINOIS DISTRIBUTION: Jackson County

This is a hybrid between *R. sachalinensis* and *R. japonica*.

Page 74. *Polygonum virginianum* L. The following counties should be added to the distribution map on page 74: Carroll, Clinton, Effingham, Franklin, Woodford. This species is now in the genus **Antenoron**. Taxonomy of the genus follows:

Antenoron Raf.—Jumpseed

Perennial herbs with rhizomes; stems erect, branched or unbranched; leaves alternate, simple, entire; ocreae pubescent and ciliate; inflorescence of terminal and axillary, highly interrupted racemes; flowers perfect, actinomorphic, pedicellate; calyx 4-parted, the sepals white; petals

absent; stamens 5; style 2-cleft; achenes lenticular, exserted, the styles persistent as a beak.

There are three species in the genus, the other two occurring in eastern Asia.

Although the members of this genus are often included within *Polygonum*, it differs from that and other members of the family by its 4-parted calyx and its persistent styles of the achenes.

The Illinois species is now known as *Antenoron virginianum*. Its taxonomy follows:

Antenoron virginianum (L.) Roberty & Vautier, Boissera 10:35. 1964.

Polygonum virginianum L. Sp. Pl. 1:360. 1753.

Persicaria virginiana (L.) Gaertn. Fruct. Sem. Pl. 2:180. 1790.

Tovara virginiana (L.) Raf. Fl. Tell. 3:12. 1836.

The illustration for this species on page 75 should be *Antenoron virginicum*.

Page 74. *Polygonum careyi* Olney. The following county should be added to the distribution map on page 77: Iroquois. The illustration for this species on page 76 should be *Persicaria careyi*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria careyi (Olney) Greene, Leaflets 1:24. 1904.

Polygonum careyi Olney, Proc. Providence Franklin Soc. 1:29. 1847.

Page 77. *Polygonum orientale* L. There are no new records for this species. The illustration for this species on page 78 should be *Persicaria orientalis*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria orientalis (L.) Spach, Hist. Nat. Veg. 10:535. 1841.

Polygonum orientale L. Sp. Pl. 1:363. 1753.

Page 79. *Polygonum punctatum* Ell. There are no new records for this species. The illustration for this species on page 80 should be *Persicaria punctata*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria punctata (Ell.) Small, Fl. S. E. U. S. 379. 1903.

Polygonum punctatum Ell. Bot. S. C. & Ga. 1:455. 1817.

Page 81. *Polygonum hydropiper* L. The following counties should be added to the distribution map on page 81: Coles, Franklin, Gallatin, Jackson, Randolph, Washington. The illustration for this species on page 82 should be *Persicaria hydropiper*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria hydropiper (L.) Opiz, Seznam 72. 1852.

Polygonum hydropiper L. Sp. Pl. 1:361. 1753.

Polygonum hydropiper L. var. *projectum* Stanford, Rhodora 29:87. 1927.

Page 83. *Polygonum persicaria* L. The following counties should be added to the distribution map on page 83: Livingston, Rock Island, Whiteside. The illustration for this species on page 84 should be *Persicaria maculosa*. This species is now in the genus *Persicaria*. Since *Persicaria persicaria*, the oldest combination, is a tautonym and not allowed by the International Rules of Botanical Nomenclature, its correct binomial is *Persicaria maculosa*. Its taxonomy follows:

Persicaria maculosa S. F. Gray, Nat. Arr. Brit. Pl. 2:269. 1821.

Polygonum persicaria L. Sp. Pl. 1:361. 1753.

Persicaria vulgaris Webb & Moq. Hist. Nat. Iles Can. 3:209. 1831.

Persicaria persicaria (L.) Small, Fl. S. E. U. S. 378. 1903.

Page 83. *Polygonum cespitosum* Blume var. *longisetum* (DeBruyn) Steward. The following counties should be added to the distribution map on page 86: Cass, DeKalb, Fayette, Gallatin, Hardin, Johnson, Kankakee, Lawrence, Lee, Marion, Pike, Pope, Randolph, Schuyler, Shelby, Union, Vermilion. The illustration for this species on page 85 should be *Persicaria longiseta*. This plant is now in the genus *Persicaria* and has been elevated to the rank of species. Its taxonomy follows:

Persicaria longiseta (DeBruyn) Kitagawa, Rep. Inst. Sci. Res. Manchoukuo 1: 322. 1937.

Polygonum longisetum DeBruyn in Miq. Pl. Jungh. 3:307. 1854.

Polygonum cespitosum Blume var. *longisetum* (DeBruyn) Steward, Contr. Gray Herb. 88:67. 1930.

Persicaria cespitosa (Blume) Nakai var. *longiseta* (DeBruyn) C. F. Reed, Phytologia 65:410. 1987.

Page 86. *Polygonum setaceum* Baldw. var. *interjectum* Fern. The following counties should be added to the distribution map on page 88: Franklin, Johnson, Pulaski, Saline, Wayne. The illustration for this species on page 87 should be *Persicaria setacea*. This plant is now in the genus *Persicaria*, and I am no longer recognizing var. *interjectum* as a distinct entity. Its taxonomy follows:

Persicaria setacea (Baldw.) Small, Fl. S. E. U. S. 379. 1903.

Polygonum setaceum Baldw. in Ell. Sketch Bot. S. Car. 1:455. 1817.

Polygonum setaceum Baldw. var. *interjectum* Fern. Rhodora 40:414. 1938.

Polygonum hydropiperoides Michx. var. *setaceum* (Baldw.) Gl. Phytologia 4:23. 1952.

Page 88. *Polygonum hydropiperoides* Michx. The following county should be added to the distribution map on page 90: Lee. The illustration for this species on page 89 should be *Persicaria hydropiperoides*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria hydropiperoides (Michx.) Small, Fl. S. E. U. S. 378. 1903.

Polygonum hydropiperoides Michx. Fl. Bor. Am. 1:239. 1803.

Polygonum barbatum Walt. Fl. Carol. 131. 1788, non L. (1753).

Polygonum persooni Engelm. ex Mead, Prairie Farmer 6:119. 1848, *nomen nudum*.

Page 90. *Polygonum opelousanum* Riddell ex Small. The following county should be added to the distribution map on page 92: Kankakee. The illustration for this species on page 91 should be *Persicaria opelousana*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria opelousana (Riddell ex Small) Small, Fl. S. E. U. S. 378. 1903.

Polygonum opelousanum Riddell ex Small, Bull. Torrey Club 19:354. 1892.

Page 92. *Polygonum amphibium* L. This species is now assigned to the genus *Persicaria*. After vacillating for many years, I have concluded that *Persicaria amphibia* and *P. coccinea* should be considered distinct species, partly because of the shape and length of the spikes, although

admittedly there is intergradation between the two. Many botanists combine these two, but intensive study in wetlands, particularly since 1989, have convinced me that the two should be treated as separate species. *Persicaria amphibia* is known in Illinois from the following counties: Bond, Boone, Champaign, Cook, DeKalb, DuPage, Grundy, Hancock, Henderson, Iroquois, Kane, Kankakee, Kendall, Lake, Lawrence, Lee, Logan, Macoupin, Massac, McHenry, Ogle, Peoria, Piatt, Stark, Tazewell, Wabash, Will. The illustrations for this species on pages 94 and 95 should be *Persicaria amphibia*. The illustration on page 96 should be *Persicaria coccinea*.

Since the description of *P. amphibia* on page 95 of the first edition included the characteristics of *P. coccineum* as well, a new description for *Persicaria amphibia* appears below.

The taxonomy of *Persicaria amphibia* follows:

Persicaria amphibia (L.) S. F. Gray, Nat. Arr. Brit. Pl. 2:268. 1821.

Polygonum amphibia L. Sp. Pl. 1:361. 1753.

Polygonum amphibia L. var. *emersum* Michx. Fl. Bor. Am. 1:240. 1803.

Polygonum amphibia L. var. *natans* Michx. Fl. Bor. Am. 1:240. 1803.

Polygonum natans (Michx.) Eaton, Man. Bot., ed. 3, 400. 1822.

Polygonum amphibia L. var. *aquaticum* Torr. Fl. N. & Mid. U. S. 1:404. 1824.

Polygonum amphibia L. var. *muhlenbergii* Meisn. ex DC. Prodr. 14:116. 1856.

Polygonum hartwrightii Gray, Proc. Am. Acad. 8:294. 1870.

Polygonum amphibia L. var. *stipulaceum* Coleman, Cat. Fl. Pl. S. Penins. Mich. 32. 1874.

Polygonum muhlenbergii (Meisn.) S. Wats. Proc. Am. Acad. 14:295. 1879.

Polygonum emersum (Michx.) Britt. Trans. N. Y. Acad. Sci. 8:73. 1889.

Polygonum amphibia L. var. *hartwrightii* (Gray) Bissell, Rhodora 4:104. 1902.

Polygonum fluitans (Eaton) Greene, Leaflets 1:26. 1904.

Persicaria muhlenbergii (Meisn.) Small ex Rydb. Fl. Colo. 111. 1906.

Polygonum amphibium L. var. *marginatum* f. *hirtuosum* Farw. Papers Mich. Acad. Sci. 1:93. 1923.

Polygonum natans (Michx.) Eaton f. *hartwrightii* (Gray) Stanford, Rhodora 27:160. 1925.

Polygonum amphibium L. var. *stipulaceum* Coleman f. *hirtuosum* (Farw.) Fern. Rhodora 48:49. 1946.

Polygonum fluitans Eaton f. *hartwrightii* (Gray) G. N. Jones, Fol. Ell. 124. 1950.

Aquatic or terrestrial perennial herbs from rhizomes or stolons, often rooting at the nodes; stems floating or trailing or erect, glabrous or pubescent, unbranched, to 50 cm long; leaves elliptic to nearly oval, obtuse to acute to acuminate at the apex, tapering to the base, entire or undulate and sometimes ciliate along the margins, glabrous or pubescent on both surface, to 15 cm long, to 6 cm wide, short-petiolate; ocreae glabrous to puberulent, fringed with short bristles or bristles absent, sometimes flanged at the summit; inflorescence composed of 1–3 racemes, the racemes erect, densely flowered, to 4 cm long, 1–2 cm thick, on stout, glabrous peduncles; flowers pedicellate; calyx 5-parted, the sepals rose to pink, 3–4 mm long; petals absent; stamens 5, some included, some exerted; style 2-cleft; achenes lenticular, obovoid to oblongoid, shiny, smooth or somewhat granular, dark brown to black, 2.5–3.0 mm long.

Page 96. Figure 49 on this page is that of *Persicaria coccinea*.

Page 97. *Polygonum bicornis* Raf. Fl. Ludov. 29. 1917. The following counties should be added to the distribution map on page 97 (bottom): Hardin, Jackson, Monroe, Randolph, Wayne. The following county should be deleted from the distribution map on page 97 (bottom): Macon. The illustration for this species on page 98 should be *Persicaria bicornis*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria bicornis (Raf.) Nieuwland, Am. Midl. Nat. 3:201. 1914.

Polygonum bicornis Raf. F. Ludov. 29. 1817.

Polygonum longistylum Small, Bull. Torrey Club 21:169. 1894.

Persicaria longistyla (Small) Small, Fl. S. E. U. S. 337. 1903.

Page 99. *Polygonum scabrum* Moench. The following county should be added to the distribution map on page 99: Lake. The illustration for this species on page 100 should be *Persicaria scabra*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria scabra (Moench) Moldenke,

Polygonum scabrum Moench, Meth. Pl. 629. 1794.

Polygonum lapathifolium L. var. *salicifolium* Sibth. Fl. Oxon. 129. 1794.

Persicaria lapathifolia (L.) S. F. Gray var. *salicifolia* (Sibth.) Miyabe, Journ. Fac. Agric. Hokkaido Univ. 26:522. 1934.

Page 99. *Polygonum lapathifolium* L. The following counties should be added to the distribution map on page 102: Edgar, Effingham, Rock Island, Saline, Williamson, Woodford. The illustration for this species on page 101 should be *Persicaria lapathifolia*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria lapathifolia (L.) S. F. Gray, Nat. Arr. Brit. Pl. 2:270. 1821.

Polygonum lapathifolium L. Sp. Pl. 1:360. 1753.

Polygonum incarnatum Ell. Bot. S. C. & Ga. 1:456. 1817.

Polygonum lapathifolium L. var. *incarnatum* (Ell.) Wats. in Gray, Man. Bot., ed. 6, 440. 1890.

Polygonum lapathifolium L. var. *nodosum* Small, Mem. Torrey Club 5:140. 1894.

Page 102. *Polygonum pensylvanicum* L. There are no new records for this species. I am synonymizing var. *laevigatum* and var. *durum* with the typical variety. The illustration for this species on page 104 should be *Persicaria pensylvanica*. This species is now in the genus *Persicaria*. Its taxonomy follows:

Persicaria pensylvanica (L.) Small, Fl. S. E. U. S. 377. 1903.

Polygonum pensylvanicum L. Sp. Pl. 1:362. 1753.

Polygonum pensylvanicum L. var. *laevigatum* Fern. Rhodora 19:78. 1917.

Polygonum pensylvanicum L. var. *durum* Stanford, Rhodora 27:178. 1925.

The following species of *Persicaria* are new to Illinois and should be added after *Polygonum pensylvanicum* L. var. *durum* Stanford on page 105:

Persicaria bungeana (Turcz.) Nakai in T. Mori, Enum. Pl. Corea 131. 1922. Fig A9.

Polygonum bungeanum Turcz. Bull. Soc. Imp. Nat. Moscou 13:77. 1840.

Annual herbs from fibrous roots; stems ascending to erect, short-prickly, to 75 cm tall; leaves alternate, simple, lanceolate to elliptic, acute to acuminate at the apex, tapering to the base, the margins and



A9. *Persicaria bungeana* (Prickly smartweed). Habit (left). Stem with prickles (lower right). Seed (lower center).

veins with prickly cilia, to 12 cm long, to 3.5 cm wide, the petioles up to 1.5 cm long; ocreae with bristles to 4 mm long; inflorescence a panicle of racemes, the racemes sometimes interrupted, to 4.5 cm long, to 1 cm thick; flowers pedicellate, the pedicels 2–3 mm long; calyx 5-parted, green tinged with red, 3–4 mm long; stamens 8; styles 2-cleft; achenes biconvex, dull, black, rugose. July–September.

COMMON NAME: Prickly smartweed.

HABITAT: Old fields.

RANGE: Native to Europe; scattered in the United States.

ILLINOIS DISTRIBUTION: DuPage and Kane counties.

This is the only species of *Persicaria* in Illinois that is prickly. Two other prickly species, often placed in *Polygonum* but considered in this work to be in the genus *Tracaulon*, are vines with sagittate or hastate leaves.

Persicaria coccinea (Muhl.) Greene, Leaflets 1:24. 1904. See Figure 49 on page 96.

Polygonum coccineum Muhl. ex Willd. Enum. Pl. 1:428. 1809.

Polygonum coccineum Muhl. ex Willd. var. *terrestre* Muhl. ex Willd. Enum Pl. 1:428. 1809.

Persicaria pratincola Green, Leaflets 1:36. 1904.

Persicaria spectabilis Greene, Leaflets 1:37. 1904.

Polygonum coccineum Muhl. ex Willd. f. *terrestre* (Muhl. ex Willd.) Stanford, Rhodora 27:162. 1925.

Polygonum coccineum Muhl. ex Willd. var. *pratincola* (Greene) Stanford, Rhodora 27: 162. 1925.

Aquatic or terrestrial perennial herbs from rhizomes or stolons; stems floating or erect, glabrous or pubescent, branched or unbranched, to 60 cm tall; leaves lanceolate to lance-ovate, obtuse to acute at the apex, rounded or subcordate at the base, less commonly tapering to the base, entire or undulate along the margins, glabrous or pubescent on both surfaces, to 20 cm long, to 8 cm wide, usually short-petiolate; ocreae usually pubescent, with or without a fringe of short bristles, not flanged at the summit; inflorescence composed of 1–3 racemes, the racemes erect, somewhat loosely to densely flowered, 4–18 cm long, 7–15 mm thick, on stout, pubescent peduncles; flowers pedicellate; calyx 5-parted, the sepals rose to red, 3–5 mm long; petals absent; stamens 5, some included and some exserted; style 2-cleft; achenes lenticular, obovoid to oblongoid,

shiny, smooth or somewhat granular, dark brown to black, 2.5–3.0 mm long. June–September.

COMMON NAME: Scarlet smartweed.

HABITAT: Wet ground or in standing water.

RANGE: Throughout much of the United States.

ILLINOIS DISTRIBUTION: All counties except the following: Edwards, Livingston, Richland, Shelby, Wayne.

This species, which may be conspecific with *P. amphibia*, differs from the latter by the longer, thinner racemes, its pubescent peduncles, and its usually rounded or subcordate leaf bases.



A10. *Persicaria glabra* (Smooth smartweed). Habit (center). Seed (left center). Flower (upper right).

Persicaria glabra (Willd.) M. Gomez, Anal. Inst. Segunda Ensen. 2:278. 1896. Fig. A10.

Polygonum glabrum Willd. Pl. Pl. 2:447. 1799.

Polygonum densiflorum Blume, Bijdr. Fl. Ned. Ind. 11:533. 1826.

Polygonum portoricense Bertero ex Small, Mem. Dept. Bot. Col. Univ. 1:46. 1895.

Persicaria densiflora (Blume) Moldenke, Torreya 34:7. 1934.

Perennial herbs with rhizomes; stems decumbent to erect, branched, glabrous, occasionally punctate, to 1.5 m tall; leaves alternate, simple, lanceolate, acute to acuminate at the apex, tapering to the base, to 30 cm long, to 5 cm wide, glabrous or strigose on the upper surface, glabrous or scabrous on the veins on the lower surface, occasionally punctate, the petioles to 2 cm long; ocreae glabrous, without bristles; inflorescence a panicle of racemes, the racemes more or less erect, to 10 cm long, to 10 mm thick, densely flowered, uninterrupted, on glabrous, punctate peduncles; flowers pedicellate, the pedicels up to 5 mm long; calyx 5-parted, the sepals white or pink, 3.0–3.5 mm long; petals absent; stamens 5–7; style 2-cleft; achenes biconvex, dark brown to black, smooth, shiny, 2.0–2.2 mm long. August–November.

COMMON NAME: Smooth smartweed.

HABITAT: Wet roadside ditch.

RANGE: Virginia to Missouri, south to Texas and Florida.

ILLINOIS DISTRIBUTION: Known only from Alexander County.

This species is similar to *P. lapathifolia* except that it has more or less erect racemes, biconvex achenes, and often pink sepals.

Persicaria robustior (Small) Bickn. Bull. Torrey Club 36:455. 1909. Fig. A11.

Polygonum coarctatum Willd. var. *majus* Meisn. Prod. Syst. 14:101. 1856.

Polygonum punctatum Ell. var. *robustior* Small. Bull. Torrey Club 21:477. 1894.

Persicaria punctata (Ell.) Small var. *robustior* (Small) Small, Fl. S. E. U. S. 379. 1903.

Polygonum punctatum Ell. var. *majus* (Meisn.) Fassett, Brittonia 6:373–374. 1949.

Polygonum robustius (Small) Fern. Rhodora 23:147. 1921.

Perennial herbs with rhizomes and often stolons; stems decumbent



A11. *Persicaria robustior* (Stout smartweed). Habit (center). Node and sheath (upper left). Flower (lower left). Seed (lower right).

to ascending to erect, green or reddish, branched, glabrous, punctate, to 2 m tall; leaves alternate, simple, lanceolate to elliptic-lanceolate, acute to acuminate at the apex, tapering to the base, entire, glabrous except for scabrous veins on the lower surface and strigose margins, punctate, to 20 cm long, to 4.5 cm wide, the petioles to 2 cm long; ocreae strigose, punctate, fringed with bristles to 12 mm long; inflorescence of terminal and axillary paniced racemes, the racemes rather stout, erect, to 80 cm long, continuous; flowers pedicellate, the pedicels to 5 mm long; calyx 5-parted, the sepals usually white, punctate, 3–4 mm long; petals absent; stamens 6–8; style 3-cleft; achenes trigonous, oblongoid, smooth, shiny, 2.5–3.5 mm long. July–October.

COMMON NAME: Stout smartweed.

HABITAT: Edge of lake, in shallow water.

RANGE: Maine to Ontario, south to Missouri and Virginia; also in Florida and Texas.

ILLINOIS DISTRIBUTION: Lake Murphysboro State Park, Jackson County; also Henry County, collected by Michael Hayes.

This species is often considered to be a more robust form of *P. punctata*. It differs from *P. punctata* by its continuous racemes, longer leaves, and stouter stature.

Page 106. *Hamamelis virginiana* L. The following county should be added to the distribution map on page 108: Marshall.

Page 109. *Liquidambar styraciflua* L. The following county should be added to the distribution map on page 109: Perry.

Page 111. *Platanus occidentalis* L. There are no new records for this species.

Page 115. *Fagus grandifolia* Ehrh. var. *caroliniana* (Loud.) Fern. & Schub. The following county should be added to the distribution map on page 117: Effingham.

Page 118. *Castanea dentata* (Marsh.) Borkh. The following counties should be added to the distribution map on page 118 for adventive specimens: Adams, Champaign, DeKalb, Henry, Jackson, Lawrence, Stephenson, Union, Wayne.

Page 120. *Castanea mollissima* Blume. The following counties should be added to the distribution map on page 122: Alexander, Champaign, DuPage, Saline, Union.

Page 126. *Quercus* L. With the addition of an adventive species of *Quercus* new to Illinois since the first edition of this book, the following new key to *Quercus* follows:

1. Leaves entire.
 2. Leaves stellate-pubescent beneath; cup of acorn at least 1.5 cm broad _____ *Q. imbricaria*
 2. Leaves glabrous or nearly so; cup of acorn up to 1.2 cm broad _____ *Q. phellos*
1. Leaves toothed or lobed.
 3. Leaves toothed.
 4. Acorns on stalks at least 2 cm long; veins of leaves not reaching the tip of the teeth _____ *Q. bicolor*
 4. Acorns sessile or on stalks up to 1 cm long; veins of leaves reaching the tip of the teeth.
 5. Leaves velvety-tomentose beneath; cup of acorn at least 2.5 cm across _____ *Q. michauxii*
 5. Leaves glabrous or minutely pubescent but not velvety; cup of acorn less than 2.5 cm across.
 6. Leaves with pointed or bristle-tipped teeth; acorns up to 2 cm across.
 7. Leaves with up to 13 sharp teeth on either margin; scales of acorn cup closely appressed _____ *Q. muehlenbergii*
 7. Leaves with more than 13 bristle-tipped teeth on either margin; scales of acorn cup thick-fringed _____ *Q. acutissima*
 6. Leaves with more or less rounded teeth; acorns 2.0–2.5 cm across _____ *Q. montana*
 3. Leaves lobed.
 8. Lobes of leaves with bristle tips.
 9. Leaves permanently uniformly pubescent throughout on the lower surface.
 10. Leaves much broader in the upper ½, with 3 (–5) broad, shallow lobes _____ *Q. marilandica*
 10. Leaves broader at or below the middle, with (3–) 5–11 narrower, deeper lobes.
 11. Lower leaf surface grayish or yellowish; scales of buds reddish brown, glabrous or nearly so; terminal winter buds up to 6 mm long.
 12. Terminal and usually 1 or 2 lateral lobes of leaf curved; base of leaf more or less rounded _____ *Q. falcata*
 12. All lobes of leaf straight or nearly so; base of leaf truncate to somewhat tapering, not rounded _____ *Q. pagoda*
 11. Lower leaf surface brownish or reddish brown; scales of buds grayish, tomentose; terminal winter buds 6–12 mm long _____ *Q. velutina*

- 9. Leaves glabrous beneath, or with tufts of axillary hairs, or irregularly pubescent.
 - 13. Leaves much broader in the upper ½, with 3 (-5) broad, shallow lobes _____ *Q. marilandica*
 - 13. Leaves broader at or below the middle, with 5-11 narrower, deeper lobes.
 - 14. Terminal winter buds 6-12 mm long, gray-tomentose; scales along the margin of the acorn cup not appressed; upper leaf surface with a pubescent midnerve _____ *Q. velutina*
 - 14. Terminal winter buds up to 4 mm long, not gray-tomentose; scales along the margin of the acorn cup appressed; upper leaf surface with a glabrous midnerve.
 - 15. Leaves lobed less than halfway to middle; cup covering less than ¼ of acorn _____ *Q. rubra*
 - 15. Leaves lobed at least halfway to middle; cup covering at least ¼ of acorn.
 - 16. Acorn cup covering much more than ½ of acorn.
 - 17. Acorn up to 1.5 cm long; cup not exceeding 1.5 cm in diameter _____ *Q. palustris*
 - 17. Acorn more than 1.5 cm long; cup more than 1.5 cm in diameter.
 - 18. Buds glabrous; leaves not long-tapering to the tip; some of the leaves usually truncate at the base; acorn cup mostly 2 cm broad or broader _____ *Q. shumardii*
 - 18. Buds puberulent or at least ciliate; leaves tending to be long-tapering to the tip; most of the leaves tapering to the base; acorn cup mostly 1.5-2.0 cm broad _____ *Q. texana*
 - 16. Acorn cup covering about ½ of the acorn.
 - 19. Acorn cup up to 1.5 cm in diameter, with pubescent scales _____ *Q. ellipsoidalis*
 - 19. Acorn cup at least 1.5 cm in diameter, with glabrous scales _____ *Q. coccinea*
8. Lobes of leaves without bristle tips.
 - 20. Leaves completely glabrous beneath _____ *Q. alba*
 - 20. Leaves pubescent beneath, at least in the leaf axils.
 - 21. Leaves 3- or 5-lobed, the upper 3 with squarish tips, forming a cross; acorn up to 1 cm across, the cup unfringed and covering less than ½ the acorn _____ *Q. stellata*

- 21. Leaves 5- to 11-lobed, the upper 3 without squarish tips; acorn 1 cm broad or broader, the cup either fringed or covering 1/2 to nearly all the acorn.
- 22. Scales of cup forming a fringe around the acorn; cup of acorn 1/2-4/5 covering the acorn _____ *Q. macrocarpa*
- 22. Scales of cup not forming a fringe; cup of acorn nearly completely covering the acorn _____ *Q. lyrata*

Page 129. *Quercus phellos* L. There are no new records for this species.

Page 131. *Quercus imbricaria* Michx. The following county should be added to the distribution map on page 131: Henry.

Page 134. *Quercus shumardii* Buckl. var. *shumardii*. The following counties should be added to the distribution map on page 134 (top): Christian, Clark, Edwards, Monroe, Perry.

Page 134. *Quercus shumardii* Buckl. var. *schneckii* (Britt.) Sarg. There are no new records for this variety.

Page 137. *Quercus rubra* L. The following counties should be added to the distribution map on page 137: Adams, Hancock, Lee, Marion, Mercer, Whiteside.

Page 140. *Quercus velutina* Lam. f. *velutina*. There are no new records for this form.

Page 143. *Quercus velutina* Lam. f. *missouriensis* (Sarg.) Trel. The following county should be added to the distribution map on page 143: Jackson.

Page 143. *Quercus ellipsoidalis* E. J. Hill. The following counties should be added to the distribution map on page 145: Carroll, Henry, Rock Island.

Page 145. *Quercus coccinea* Muenchh. The following counties should be added to the distribution map on page 147: Jefferson, Monroe, Williamson.

Page 147. *Quercus palustris* Muenchh. The following counties should be added to the distribution map on page 148: JoDaviess, Rock Island.

Page 150. *Quercus nuttallii* Palmer. The following counties should be added to the distribution map on page 152: Massac, Pulaski. The illustration for this species on page 151 should be *Quercus texana*. This species is now known as *Q. texana*. Its taxonomy follows:

Quercus texana Buckl. Proc. Acad. Nat. Sci. Phila. 12:444-45. 1860.

Quercus nuttallii Palmer, Journ. Arn. Arb. 8:52. 1927.

Quercus nuttallii Palmer var. *cachensis* Palmer, Journ. Arn. Arb. 18:136. 1937.

Quercus palustris Muenchh. f. *nuttallii* (Palmer) C. H. Muller, Am. Midl. Nat. 27:478. 1942.

Page 152. *Quercus marilandica* Muenchh. There are no new records for this species.

Page 154. *Quercus falcata* Michx. The following counties should be added to the distribution map on page 156: Randolph, Washington.

Page 156. *Quercus pagoda* Raf. The following counties should be added to the distribution map on page 158: Franklin, Gallatin, Saline.

Page 158. *Quercus alba* L. There are no new records for this species.

Page 161. *Quercus prinoides* Willd. in Muhl. & Willd. var. *acuminata* (Michx.) Gl. The following counties should be added to the distribution map on page 162: Edwards, Stark. The illustration for this species on pages 163 and 164 should be *Quercus muehlenbergii*. This plant is now recognized at the species level as *Q. muehlenbergii*. Its taxonomy follows:

Quercus muehlenbergii Engelm. Trans. Acad. Sci. St. Louis 3:391. 1877.

Quercus prinus L. var. *acuminata* Michx. Hist. Chenes Am. Sept. Quercus No. 5. 1801.

Quercus acuminata (Michx.) Sarg. Gard. & For. 8:93. 1895.

Quercus alexanderi Britt. Man. Fl. North. States & Can. 336. 1901.

Quercus brayi Small, Bull. Torrey Club 28:358. 1901.

Quercus acuminata (Michx.) Sarg. var. *alexanderi* (Britt.) Farwell, Rept. Mich. Acad. Sci. 6:206. 1904.

Quercus acuminata (Michx.) Sarg. var. *brayi* (Small) Sarg. Bot. Gaz. 65:442. 1918.

Quercus muehlenbergii Engelm. var. *alexanderi* (Britt.) Farwell, Papers Mich. Acad. Sci. Arts & Letters 3:93. 1924.

Quercus prinoides Willd. in Muhl. & Willd. var. *acuminata* (Michx.) Gl. Phytologia 4: 23. 1952.

Page 165. *Quercus montana* Willd. There are no new records for this species.

Quercus prinus L. Sp. Pl. 995. 1753.

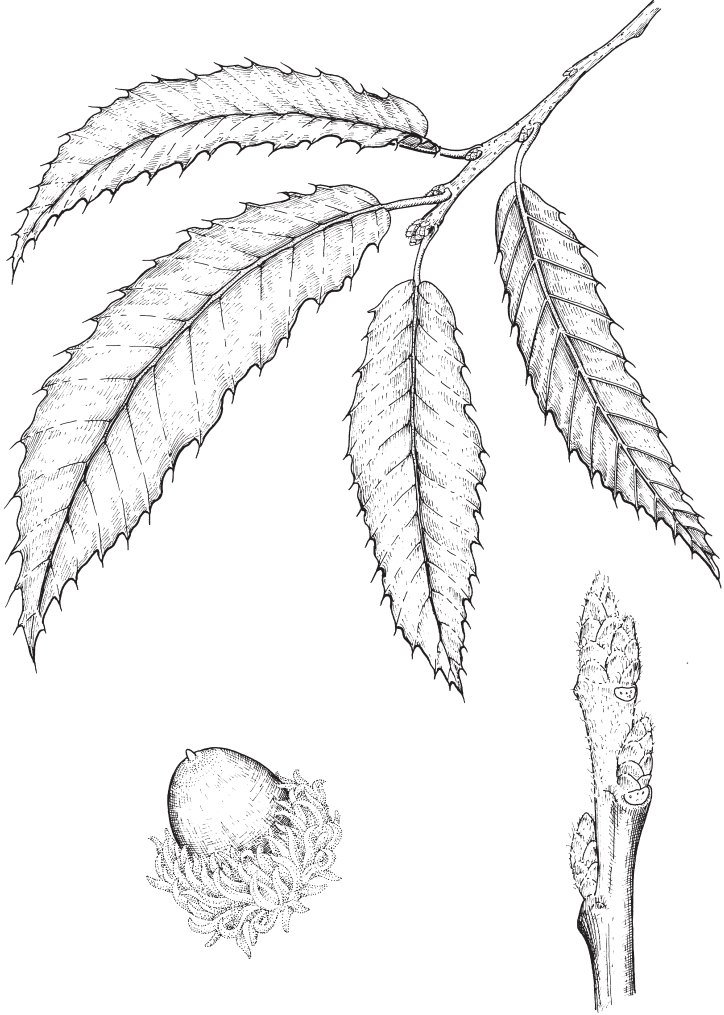
Quercus montana Willd. Sp. Pl. 4:440. 1805.

For nearly two hundred years, there has been controversy concerning Linnaeus's binomial *Quercus prinus*. Linnaeus did not select one particular specimen as the type specimen for the binomial. From his description, *Quercus prinus* could refer to either the lowland chestnut oak known today as *Q. michauxii*, or the upland chestnut oak known today as *Q. montana*. Some botanists through the years have applied *Q. prinus* to the lowland chestnut oak, while others have applied the binomial to the upland chestnut oak. Sargent in 1925 concluded that *Q. prinus* should be the name for the lowland chestnut oak, but a few years later, botanists began to use the binomial *Q. prinus* for the upland chestnut oak.

Because of the continued confusion, Whittimore and Nixon published in the journal *Taxon* in 2003 that *Quercus prinus* L. should be rejected as a *nomen ambiguum* and should no longer be used for any plant. One of the Botanical Rules of Nomenclature allows for such a procedure. The screening committee for the International Association for Plant Taxonomists (IAPT), the governing body for plant taxonomy, passed Whittimore and Nixon's proposal unanimously. When the proposal comes up for vote before the whole membership at the next meeting of the IAPT in 2012, the proposal will undoubtedly pass, thereby prohibiting the use of *Quercus prinus* L. for any species.

As an aside, however, Thomson has studied the use of foliar trichomes of oaks as a tool for identifying certain species of *Quercus*. The upland oak, *Q. montana*, has stipitate-fasciculate trichomes tufted in the vein axils on the lower surface of the leaves, while the axillary hairs on the lower surface of the leaves of the lowland oak, *Q. michauxii*, are not tufted. These are easily observable in the field. In 2002, Thomson visited the herbaria of the British Museum of Natural History and Linnaean Society Herbarium in London. Accompanied by the herbarium curator, Charlie Jarvis, Thomson examined one Linnaean specimen of *Q. prinus* in the British Museum Herbarium and one Linnaean specimen of *Q. prinus* in the Linnaean Society Herbarium. The specimen in the British Museum Herbarium is without the tufted trichome pattern. The specimen in the Linnaean Society Herbarium was attached to the herbarium sheet with the abaxial surface down. The trichomes are more apparent on that surface and so were obscured from direct examination. Thomson was able to use a strong light source from below the sheet with enough illumination

to see the vein patterns (shadows) and did not see any tufting. However, Thomson allows that it may have been present since it is less dense than a vein and may not have cast sufficient shadow to be noticeable. Thomson had with him the curator, who also examined the specimen in this manner and who agreed with his finding. Removing a portion of the specimen in



A12. *Quercus acutissima* (Sawtooth oak). Twig with leaves (*below*). Twigs with buds (*upper left*). Acorn (*upper right*).

the axial area would have been best for determination, but of course we would not think to do so.

So Thomson has one positive confirmation from Linnaean material and one strong maybe. Thus, his position on the matter is that *Q. michauxii* Nutt. should become a synonym of *Q. prinus* L.

However, assuming the IAPT accepts *Quercus prinus* L. as a *nomen ambiguum*, the point is moot.

Page 168. *Quercus michauxii* Nutt. The following counties should be added to the distribution map on page 168: Crawford, Saline.

Page 170. *Quercus bicolor* Willd. in Muhl. & Willd. The following counties should be added to the distribution map on page 170: Clark, Jasper, Marion, Mercer.

Page 172. *Quercus macrocarpa* Michx. There are no new records for this species.

Page 175. *Quercus stellata* Wangenh. There are no new records for this species.

Page 178. *Quercus lyrata* Walt. The following county should be added to the distribution map on page 178: Saline.

Page 180. After *Quercus lyrata*, the following adventive species of *Quercus* new to Illinois should be added:

Quercus acutissima Carruthers, Journ. Linn. Soc., Bot. 6:33.

1862. Fig. A12.

Trees to 20 m tall, the branches forming a broadly rounded crown, the twigs slender, red to gray to brown; trunk up to 1.5 m in diameter, the bark gray to brown; scales of winter buds pubescent along the margins; leaves alternate, simple, lanceolate, acute to acuminate at the apex, tapering or sometimes rounded at the base, to 20 cm long, to 10 cm wide, sharply serrate with more than 13 upward-pointing bristle-tipped teeth on either margin; staminate inflorescence 3–10 cm long, pendulous; pistillate inflorescence few-flowered, contracted; fruit oval to subglobose, brown, to 2.4 cm long, to 2 cm broad, the cup covering about half of the nut, with a fringe of thickened hairs. March–April.

COMMON NAME: Sawtooth oak

HABITAT: Disturbed woods.

RANGE: Native to Asia; scattered in the United States.

ILLINOIS DISTRIBUTION: near Brooklyn, St. Clair County.

The leaves strongly resemble those of the American chestnut. The acorns with their cups with thick fringes are reminiscent of the acorns of *Q. macrocarpa*.

Page 180. *Betula* L. Since *Betula pendula* is new to the Illinois flora, a new key to the species and hybrids of *Betula* follows:

1. Leaves long-acuminate to caudate at the apex, broadest at the base.
 2. Leaves long-caudate at the apex, with 18–47 teeth on each side _____
 _____ *B. populifolia*
 2. Leaves acuminate to short-caudate at the apex, with 9–28 teeth on each side _____ *B. pendula*
1. Leaves acute at the apex, broadest above the base.
 3. Leaves with 8 or more pairs of lateral veins.
 4. Bark yellowish or silvery gray, peeling off in thin layers; leaves green beneath _____ *B. alleghaniensis*
 4. Bark brownish to pinkish, peeling off in shaggy pieces; leaves pale beneath _____ *B. nigra*
 3. Leaves with up to 7 (–8) pairs of lateral veins.
 5. Bark peeling off in thin layers; small trees _____ *B. papyrifera*
 5. Bark close, not peeling off in thin layers; shrubs.
 6. Leaves acute, some or all over 3 cm long.
 7. Bark dark brown; fruiting catkins less than 1 cm thick _____
 _____ *B. X sandbergii*
 7. Bark gray; fruiting catkins at least 1 cm thick _____ *B. X purpusii*
 6. Leaves obtuse to subacute, not more than 3 cm long _____ *B. pumila*

Page 181. *Betula alleghaniensis* Britt. There are no new records for this species.

Page 183. *Betula nigra* L. The following counties should be added to the distribution map on page 185: Champaign, Clinton, Iroquois, Washington, Whiteside.

Page 185. *Betula papyrifera* Marsh. There are no new records for this species.

Page 187. *Betula populifolia* Marsh. The following county should be added to the distribution map on page 189: DuPage. The following counties should be deleted from the distribution map on page 189: Cook, Iroquois, Kane, McHenry.

Page 189. *Betula X sandbergii* Britt. There are no new records for this hybrid.

Page 191. *Betula X purpusii* Schneid. There are no new records for this hybrid.

Page 193. *Betula pumila* L. There are no new records for this species or its varieties.

After *Betula pumila* on page 196, add the following species of *Betula* that is new to Illinois since the first edition of Smartweeds to Hazelnuts:

Betula pendula Roth, Tent. Fl. Germ. 1:405. 1788. Fig. A13.

Tree to 25 m tall, the upper branches forming a rounded crown, the lower branches pendulous, the branchlets slender, brown, the trunk up to 1.5 m in diameter; leaves alternate, simple, ovate to deltoid, acuminate at the apex, tapering to more or less rounded at the base, to 8.5 cm long, to 4 cm wide, serrate, glabrous or nearly so, the petioles up to $\frac{1}{3}$ as long as the blade; staminate catkins solitary or sometimes in pairs, pendulous, up to 8 cm long, brown; pistillate catkins on short peduncles, up to 1 cm long; fruiting catkins up to 1.5 cm long, 1.5–1.8 cm thick, with 3-lobed bracts; nut ellipsoid, 2.0–2.8 mm long, narrower than its wing. April–May.

COMMON NAME: European weeping birch.

HABITAT: Low, sandy woods; disturbed woods.

RANGE: Native to Europe. Planted and sometimes escaped from cultivation in the northern United States.

ILLINOIS DISTRIBUTION: Adventive and perhaps planted in some of the following counties: Adams, Champaign, Lake, McHenry, Piatt.

The leaves of this ornamental turn a beautiful yellow in the autumn. The lower pendulous branches are also attractive.

Page 194. *Alnus* Mill. I have restudied the Illinois specimens of *Alnus* and have been observing them in the wild and have concluded that four species may be recognized in the state. Following is the key to the genus *Alnus* in Illinois:

1. Tree with a single trunk; leaves dentate, with up to 7 pairs of lateral veins _____ *A. glutinosa*
1. Small trees or shrubs, with several stems; leaves serrate or serrulate, with 8 or more pairs of lateral veins.
 2. Leaves ovate to elliptic, green or whitened beneath.
 3. Lower surface of leaves green _____ *A. incana*
 3. Lower surface of leaves whitened _____ *A. rugosa*
 2. Leaves obovate, green beneath _____ *A. serrulata*

Page 196. *Alnus glutinosa* (L.) Gaertn. The following counties



A13. *Betula pendula* (European weeping birch). Branch with leaves and fruit (center). Leaves with catkins (upper left). Staminate flower (upper center). Fruit (below center). Leaf (below right).

should be added to the distribution map on page 196: Alexander, Bureau, Champaign, Hardin, Johnson, Lake, LaSalle.

Page 198. *Alnus rugosa* (DuRoi) Spreng. var. *americana* (Regel) Fern. There are no new records for this species. The description on page 198 is for *A. incana* which I included in *A. rugosa* var. *americana* in the first edition of Smartweeds to Hazelnuts. The taxonomy of these two species follows:

Alnus rugosa (DuRoi) Spreng. Syst. Veg. 3:848. 1826. Fig. A14.

Betula alnus L. var. *rugosa* DuRoi, Diss. Obs. Bot. 32. 1771.

Alnus incana (L.) Muenchh. β *americana* Regel, Mem. Soc. Imp. Nat. Moscou Nouv. 13: 155. 1861.

Alnus rugosa (DuRoi) Spreng. var. *americana* (Regel) Fern. Rhodora 47:350. 1945.

Alnus americana (Regel) Scerep. Notul. Syst. Inst. Bot. Komarov. Acad. Sci. USSR

17:103. 1955.

Shrub to 5 m tall; bark smooth, dark brown; twigs glabrous or nearly so; leaves elliptic-ovate to ovate, obtuse to acute at the apex, rounded at the base, serrate, glabrous or nearly so except for the pubescent veins beneath, green on both surfaces, up to 15 cm long, up to 12 cm wide, with petioles up to 2 cm long; catkins appearing before the leaves, the staminate up to 7 cm long, the pistillate up to 1 cm long; fruiting "cone" 1.3–1.6 cm long, usually short-stalked; nut orbicular, with a narrow wing. March–April.

COMMON NAME: Speckled alder.

HABITAT: Disturbed woods; escaped from cultivation.

RANGE: Native to Europe; planted and sometimes escaped from cultivation in Illinois.

ILLINOIS DISTRIBUTION: Cook, DuPage, and Lake counties.

In the first edition of Smartweeds to Hazelnuts, I combined this species with *Alnus incana*, calling them *A. rugosa* (DuRoi) Spreng. var. *americana* (Regel) Fern.

The lower surface of the leaves of *A. rugosa* is green, while the lower surface of *A. incana* is whitened.

Alnus incana (L.) Muenchh. Meth. Pl. Hort. Bot. 424. 1794.

Betula alnus L. var. *incana* L. Sp. Pl. 2:983. 1753.



A14. Alnus rugosa (Speckled alder). Leafy branch with fruits (*above*). Twig with buds (*below center*). Fruit (*lower right*).

This species and *A. rugosa* are often combined, but the whitened lower leaf surfaces of *A. incana* are distinctive.

Page 192. *Alnus serrulata* (Ait.) Willd. The following counties should be added to the distribution map on page 201: Pope, Williamson.

Page 202. *Ostrya virginiana* (Mill.) K. Koch. Two varieties may be distinguished in Illinois. The following key separates these two varieties, and their taxonomy follows:

- 1. Branchlets glabrous or sparsely pubescent ___ *O. virginiana* var. *virginiana*
- 1. Branchlets densely villous _____ *O. virginiana* var. *lasia*

Ostrya virginiana (Mill.) K. Koch var. ***virginiana*** Dendrol. 2:8. 1873.

Carpinus ostrya L. Sp. Pl. 2:998. 1753.

Carpinus virginiana Mill. Gard. Dict. ed. 8, No. 4. 1768.

Ostrya virginiana (Mill.) K. Koch f. *glandulosa* Spach, Ann. Sci. Nat. Bot. 16:246. 1841.

Ostrya virginiana (Mill.) K. Koch var. *glandulosa* (Spach) Sarg. Bot. Gaz. 67:216. 1919.

This variety is known from every county in the state.

Ostrya virginiana (Mill.) K. Koch var. ***lasia*** Fern. Rhodora 38:414. 1936. Not illustrated.

This variety has been found in a few counties in the southern one-fourth of Illinois.

Page 204. *Corylus americana* Walt. There are no new records for this species.

Page 206. *Corylus rostrata* Ait. There are no new records for this species. The illustration on page 207 should be *Corylus cornuta*. This species should be called *Corylus cornuta*. Its taxonomy follows:

Corylus cornuta Marsh. Arb. Am. 37–38. 1785.

Corylus rostrata Aitl Hort. Kew. 3:364. 1789.

Page 208. *Carpinus caroliniana* Walt. Two varieties may be recognized in Illinois. The following key separates these two varieties, and their taxonomy follows:

- 1. Lower surface of leaves without glands ___ *C. caroliniana* var. *caroliniana*
- 1. Lower surface of leaves with dark glands __ *C. caroliniana* var. *virginiana*

Carpinus caroliniana Walt. var. **caroliniana** Fl. Carol. 236. 1788.

Carpinus americana Michx. Fl. Bor. Am. 2:201. 1803.

The following counties should be added to the distribution map on page 210: Carroll, Clay, Clinton, Effingham, Hamilton, Monroe, Rock Island, Warren, Washington.

Carpinus caroliniana Walt. var. **virginiana** (Marsh.) Fern. Rhodora 37:425. 1935. Not illustrated.

Carpinus betulus virginiana Marsh. Arb. Am. 25. 1785.

This variety is scattered in the southern one-sixth of Illinois.

Summary of the Taxa Treated in This Volume

<i>Families</i>	<i>Genera</i>	<i>Species</i>	<i>Lesser Taxa</i>	<i>Hybrids</i>
Polygonaceae	6	48	3	
Hamamelidaceae	2	2		
Platanaceae	1	1		
Fagaceae	3	23	3	18
Betulaceae	2	8	2	2
Corylaceae	<u>3</u>	<u>4</u>	<u>8</u>	<u>20</u>
Totals	17	86	8	20

GLOSSARY

Abaxial. Referring to the lower surface of a leaf.

Achene. A type of one-seeded, dry, indehiscent fruit with the seed coat not attached to the mature ovary wall.

Actinomorphic. Having radial symmetry; regular, in reference to a flower.

Acuminate. Gradually tapering to a point.

Acute. Sharply tapering to a point.

Adnate. Union of two unlike parts.

Ament. A spike of unisexual, apetalous flowers; a catkin.

Annual. Living only for one year.

Apical. At the apex, or tip.

Apomictic. Referring to plants produced without fertilization.

Appressed. Lying flat against the surface.

Bitegmic. Said of an ovule that has two integuments, or coats.

Bract. An accessory structure at the base of some flowers, usually appearing leaflike.

Bracteate. Bearing a bract.

Bulbous. Swollen.

Caducous. Falling away very early.

Calyx. The outermost group of structures of a flower, composed of sepals.

Capsule. A dry, dehiscent fruit composed of more than one carpel.

Carpel. A simple pistil, or one member of a compound pistil.

Carpellate. Possessing carpels.

Catkin. A cluster of sessile, apetalous, unisexual flowers; an ament.

Cilia. Marginal hairs.

Ciliate. Bearing cilia.

Cleistogamous. Hidden.

Compressed. Flattened.

Concentric. With symmetrical rings.

Cordate. Heart-shaped.

Coriaceous. Leathery.

Crenate. Round-toothed.

Crenulate. Bearing small, round teeth.

Crisped. Curled.

Cucullate. With a hood.

Cuneate. Wedge-shaped or tapering at the base.

Cupule. A small cup.

Cuspidate. Terminating in a very short point.

Cylindrical. Formed into a cylinder.

Deciduous. Falling away.

Decumbent. Lying flat, but with the tip ascending.

Deltoid. Triangular.

Dentate. With sharp teeth, the tips of which project outward.

Denticulate. With small, sharp teeth, the tips of which project outward.

Dimorphic. Occurring in two forms.

Diocious. With staminate flowers on one plant, pistillate flowers on another.

Divergent. Spreading apart.

Eglandular. Without glands.

Ellipsoid. Referring to a solid object that is broadest at the middle, gradually tapering to both ends.

Elliptic. Broadest at middle, gradually tapering to both ends.

Endosperm. Food-storage tissue in the seed.

Entire. Without teeth.

Exserted. Projected beyond.

Falcate. Sickle-shaped.

Fascicle. Cluster.

Fibrous. Referring to roots borne in tufts.

Filiform. Threadlike.

Fissured. With narrow splits, or cracks.

Fluted. Having long, round grooves.

Foliaceous. Leafy.

Furrowed. With long, narrow grooves.

Glabrate. Becoming smooth.

Glabrous. Without hairs.

Glaucous. With a whitish covering that can be rubbed off.

Globose. Round, globular.

Grain. A wartlike structure borne on the fruit of certain *Rumex* species.

Granular. Having a grainy appearance.

Half-inferior. Said of an ovary which is partly embedded in the receptacle.

Hastate. Spear-shaped.

Hemispheric. Half-round.

Hirsute. With stiff hairs.

Hispid. With short rigid hairs.

Hoary. Grayish white.

Imbricate. Overlapping.

Indurated. Hardened.

Inferior. Referring to the position of the ovary when it is surrounded by the adnate portion of the floral tube or is embedded in the receptacle.

Inflorescence. A cluster of flowers.

Involucre. A circle of bracts that subtends a flower cluster.

Keeled. Bearing a ridgelike process.

Laciniate. Divided into narrow, pointed divisions.

Lamina. The blade of a leaf.

Lanceolate. Lance-shaped; broadest near base; gradually tapering to the narrower apex.

Lanceoloid. Referring to a solid object that is broadest near base, gradually tapering to the narrower apex.

Lenticel. Corky openings on bark of twigs and branches.

Lenticellate. Bearing lenticels.

Lenticular. Lens-shaped.

Linear. Narrowly elongated and uniform in width throughout.

Locular. Referring to the locule, or cavity of the ovary or the anther.

Locule. The cavity of an ovary or an anther.

Lustrous. Shiny.

Marginate. Having a narrow winglike border.

Membranaceous. Transparent.

Monoecious. Having separate staminate and pistillate flowers on the same plant.

Mucronate. Possessing a short, abrupt tip.

Multiradiate. With several rays.

Nerve. Vein.

Node. The place on the stem from which leaves and branchlets arise.

Nut. A hard, dry, 1-seeded, indehiscent fruit.

Nutlet. A small nut.

Oblanceolate. Reverse lance-shaped; broadest at apex, gradually tapering to narrow base.

Oblique. Asymmetrical.

Oblong. Broadest at the middle, and tapering to both ends, but broader than elliptic.

Oblongoid. Referring to a solid object that, in side view, is nearly the same width throughout.

Obovate. Broadly rounded at apex, becoming narrowed below; broader than oblanceolate.

Obovoid. Referring to a solid object that is broadly rounded at the apex, becoming narrowed below.

Obtuse. Rounded at the apex.

Ocrea (pl. ocreae). A sheathing stipule, often tubular.

Ocreate. Bearing an ocrea, or sheath.

Ocreola (pl. ocreolae). A secondary, usually tubular, sheath.

Orbicular. Round.

Oval. Broadly elliptic.

Ovary. The lower swollen part of the pistil that produces the ovules.

Ovate. Broadly rounded at base, becoming narrowed above; broader than lanceolate.

Ovule. An immature seed.

Palmate. Divided radiately, like the fingers of a hand.

Panicle. A type of inflorescence composed of several racemes.

Paniculate. Bearing a panicle.

Papilla (pl. papillae). A small wart.

Pedicel. The stalk of a flower.

Pedicellate. Having a pedicel.

Peduncle. The stalk of an inflorescence.

Pedunculate. Having a peduncle.

Pendulous. Hanging.

Perennial. Living more than two years.

Perfect. Bearing both stamens and pistils in the same flower.

Petal. One segment of the corolla.

Petaloid. Resembling a petal in texture and appearance.

Petiolate. Bearing a petiole, or leafstalk.

Petiole. The stalk of a leaf.

Pilose. Bearing soft hairs.

Pistillate. Bearing pistils but not stamens.

Pith. The soft central tissue in a stem.

Plicate. Folded.

Prostrate. Lying on the ground.

Puberulent. Having minute hairs.

Pubescent. Bearing some kind of hairs.

Punctate. Dotted.

Pyramidal. Shaped like a pyramid.

Raceme. A type of inflorescence where pedicellate flowers are arranged along an elongated axis.

Receptacle. That portion of the flower to which the floral parts are usually attached.

Reflexed. Turned downward.

Reticulate. A network.

Retrorse. Pointing downward.

Rhizome. An underground, horizontal stem.

Rhombic. A shape with usually four oblique sides.

Sagittate. Shaped like an arrowhead.

Scabrous. Harshly rough.

Scarious. Thin and membranaceous.

Sepal. One segment of the calyx.

Serrate. With teeth that project forward.

Serrulate. With very small teeth that project forward.

Sessile. Without a stalk.

Sinus. The space between two adjacent lobes.

Spherical. Rounded.

Spicate. Borne in a spike.

Spike. A type of inflorescence where sessile flowers are arranged along an elongated axis.

Spinulose. Bearing small spines.

Stamen. That part of the flower that ultimately produces the pollen.

Staminate. Having only functional stamens.

Stellate. Star-shaped.

Stigma. The terminal part of the pistil.

Stipitate. Possessing a short stalk.

Stipulate. Possessing a stipule.

Stipule. A leaflike or scaly structure found at the point of attachment of a leaf to a stem.

Stolon. A slender, horizontal stem on the surface of the ground.

Striate. Marked with grooves.

Strigose. With appressed, straight hairs.

Style. The neck of the pistil between the ovary and the stigma.

Subacute. Nearly acute.

Subcordate. Nearly heart-shaped.

Subglobose. Nearly spherical.

Subinferior. Said of an ovary that is partially embedded in the receptacle.

Sublustrous. Somewhat shiny.

Subsessile. Nearly without a stalk.

Subspherical. Nearly spherical.

Superior. Referring to the position of the ovary when the free floral parts arise below the ovary.

Tendrill. A spiraling, coiling structure that enables a climbing plant to attach itself to a supporting body.

Terete. Round in cross-section.

Tomentose. Pubescent with matted wool.

Tomentum. Woolly hair.

Trichome. A hair.

Trigonous. Triangular, referring to a solid object.

Truncate. Abruptly cut across.

Tubercle. A small, wartlike process.

Turbinate. Top-shaped.

Tyloses. Growths that fill the cavities of wood cells.

Undulate. Wavy.

Unisexual. Bearing only pistillate or staminate floral parts.

Valve. A segment of the fruit.

Verticil. A whorl.

Verticillate. Whorled.

Villous. With long, soft, slender, unmatted hairs.

Whorl. An arrangement of three or more structures at a point on the stem.

Zygomorphic. Said of flowers that are bilaterally symmetrical.

LITERATURE CITED

- Bartlett, H. H. 1951. Regression of *Quercus X deamii* toward *Quercus macrocarpa* and *Quercus muehlenbergii*. *Rhodora* 53:249-64.
- Cronquist, A. 1968. The evolution and classification of flowering plants. Boston: Houghton Mifflin Co. 1,262 pp.
- . 1981. An integrated system of classification of flowering plants. New York: Columbia Univ. Press. 1,262 pp.
- Dyal, S. C. 1936. A key to the species of oaks of eastern North America based on foliage and twig characters. *Rhodora* 38:53-63.
- Engelmann, G. 1877. About the oaks of the United States. *Trans. St. Louis Acad. Sci.* 3:385-400.
- Gleason, H. A. 1952. Change of name for certain plants of the "manual range." *Phytologia* 4:20-25.
- Hardin, J. W. 1976. Terminology and classification of *Quercus* trichomes. *Journal of the Elisha Mitchell Scientific Society* 92:151-61.
- . 1979. *Quercus prinus* L.—*nomen ambiguum*. *Taxon* 28:355-57.
- Hutchinson, J. 1959. The families of flowering plants. 2nd ed. Oxford: Clarendon Press. 968 pp.
- Jensen, R. J. 1977. Numerical analysis of the scarlet oak complex (*Quercus* subgen. *Erythrobalanus*) in the eastern United States: Relationships above the species level. *Systematic Botany* 2:122-33.
- Jones, G. N., G. D. Fuller, G. S. Winterringer, H. E. Ahles, & A. Flynn. 1955. Vascular plants of Illinois. Urbana: Univ. of Illinois Press. 593 pp.
- Löve, A., & D. Löve. 1956. Chromosomes and taxonomy of eastern North American *Polygonum*. *Canadian Journal of Botany* 34:501-21.
- Miller, R. B., & L. R. Tehon. 1926. Native and naturalized trees of Illinois. *Bulletin of the Illinois Natural History Survey* 18:1-337.
- Mohlenbrock, R. H. 1975. Guide to the vascular flora of Illinois. Carbondale: Southern Illinois Univ. Press. 494 pp.
- . 1986. Guide to the vascular flora of Illinois. Revised and enlarged edition. Carbondale: Southern Illinois Univ. Press. 508 pp.
- Nuttall, T. 1818. The genera of North American plants. Philadelphia: Heartt. 566 pp.
- Palmer, E. J. 1942. The red oak complex in the United States. *American Midland Naturalist* 27:732-40.
- . 1948. Hybrid oaks of North America. *Journal of the Arnold Arboretum* 29:1-48.

- Sargent, C. S. 1918. Notes on North American trees. I. *Quercus*. Botanical Gazette 65:423.
- Shinners, L. H. 1967. Species of *Bilderdykia* (*Tiniaria*, *Polygonum* in part) transferred to *Reynoutria* (Polygonaceae). Sida 3:117-18.
- Steiermark, J. A. 1963. Flora of Missouri. Ames: Iowa State Univ. Press. 1,728 pp.
- Swink, F. 1974. Plants of the Chicago region. 2nd ed. Lisle, Ill.: Morton Arboretum. 474 pp.
- Swink, F., & G. Wilhelm. 1979. Plants of the Chicago region. Lisle, Ill.: Morton Arboretum. 922 pp.
- Thomson, P. M. 1978. The *Quercus prinoides* Willd. complex in the central states. Ph.D. diss., Southern Illinois Univ., Carbondale. 145 pp.
- Thomson, P. M., & R. C. Anderson. 1976. An ecological investigation of the oakwood bottoms greentree reservoir in Illinois. Proceedings of the First Central States Hardwood Conference. Carbondale, Ill.
- Thomson, P. M., & R. H. Mohlenbrock. 1979. Foliar trichomes of *Quercus* subg. *Quercus* in the eastern United States. Journal of the Arnold Arboretum 60:350-66.
- Thorne, R. F. 1968. Synopsis of a putatively phylogenetic classification of the flowering plants. Aliso 6:57-66.
- Trelease, W. 1924. The American oaks. Memoirs of the Natural Academy of Science 20:1-256.
- Willdenow, K. L. 1805. Species plantarum. 4th ed. Berlin: G. C. Nauck. 1,157 pp.

INDEX OF PLANT NAMES

Plant names in roman type are accepted names, while those in italics are synonyms and are not considered valid. Page numbers in bold refer to pages that contain illustrations.

Alder	194	Betulaceae	180
Black	196	<i>Bilderdykia</i>	50
European	196	<i>cristata</i>	50
Speckled	198, 261	Bindweed	
Alnus	194, 259	Black	48
<i>alnus</i>	196	Birch	180
<i>americana</i>	198	Canoe	187
<i>glutinosa</i>	196, 197 , 259	Dwarf	193, 194
<i>incana</i>	198, 211, 261	European Weeping	259
<i>rugosa</i>	198, 199 , 261, 262	Gray	189
<i>serrulata</i>	198, 200 , 263	Paper	187
<i>vulgaris</i>	196	Purpus	191
Antenoron	238	Red	185
<i>virginiana</i>	239	River	185
		Sandberg's	191
Beech	115, 117	Smooth Dwarf	194
Blue	208	Yellow	183
Betula	180, 288	Blue Beech	208
<i>alba</i>	185	Brunnichia	6, 216
<i>alleghaniensis</i>	181, 182 , 258	<i>ovata</i>	6, 7, 216
<i>alnus</i>	196	Buckwheat	37, 39
<i>glutinosa</i>	196	Bristly Climbing	228
<i>lenta</i>	211	Climbing	230
<i>lutea</i>	181	Crested False	50
<i>nigra</i>	182, 184 , 258	False	52
<i>papyracea</i>	185	Buckwheat Vine	6
<i>papyrifera</i>	185, 186 , 258		
<i>pendula</i>	259, 260	Carpinus	208
<i>populifolia</i>	187, 188 , 258	<i>americana</i>	208
<i>pumila</i>	193, 195 , 258	<i>betulus</i>	208
<i>purpusii</i>	191, 192 , 258	<i>caroliniana</i>	208, 209 , 263
<i>rubra</i>	183	<i>ostrya</i>	202
<i>sandbergii</i>	189, 190 , 258	<i>virginiana</i>	202
<i>serrulata</i>	198	Castanea	117

276 / INDEX OF PLANT NAMES

Castanea (continued)		Filbert	
<i>dentata</i>	118, 119 , 250	American	206
<i>mollissima</i>	120, 121 , 250		
<i>pumila</i>	211	Gum	
<i>sativa</i>	211	Red	109
Chestnut	211	Sweet	108, 109
American	117		
Chinese	118	Hamamelidaceae	106
Corylaceae	201	Hamamelidales	106
Corylus	204	Hamamelis	106
<i>americana</i>	204, 205 , 263	<i>virginiana</i>	106, 107 , 250
<i>cornuta</i>	263	Hazelnut	01, 204, 206
<i>rostrata</i>	206, 207 , 263	Beaked	208
		Common	201
Dock	13, 19, 35	Smooth	201
Bitter	25	Hop Hornbeam	201, 202
Clustered Green	220	Hornbeam	
Crested	37	American	210
Curly	27	Hop	201, 202
Golden	22		
Narrow-leaved Curly	222	Ironwood	202, 210
Pale	31		
Patience	25	Jointweed	8, 10
Sour	15, 17	Jumpseed	238
Swamp	33		
Unlobed Sour	17	Knotweed	39, 57
Toothed	220	Bohemian	238
Water	33	Giant	72
		Japanese	72
Fagaceae	114	Long-fruited	62
Fagales	114	Narrow-leaved	234
Fagopyrum	37, 222	Slender	54
<i>esculentum</i>	37, 40 , 222	Tuberled	234
<i>fagopyrum</i>	37	Virginia	74
<i>sagittatum</i>	37		
Fagus	115	Ladies' Eardrops	8
<i>americana</i>	115	Lady's Thumb	83
<i>ferruginea</i>	115	Liquidambar	108
<i>grandifolia</i>	115, 116 , 250	<i>styraciflua</i>	109, 110 , 111 , 250
Fallopia	225		
<i>convolvulus</i>	226	Musclewood	210
<i>cristata</i>	226		
<i>cilianodis</i>	227 , 228	Oak	122
<i>dumetorum</i>	228, 229	Basket	168
<i>scandens</i>	228	Black	142

Blackjack	154	<i>pensylvanica</i>	102, 244
Bur	174	<i>persicaria</i>	83
Cherrybark	158	<i>pratincola</i>	92
Chinquapin	162	<i>punctata</i>	79, 239
Cow	168	<i>robustior</i>	248, 249
Hill's	145	<i>scabra</i>	244
Missouri Black	143	<i>setacea</i>	241
Mossy-cup	174	<i>spectabilis</i>	92
Northern Red	137	Plane Tree	111, 113
Nuttall's	152	Platanaceae	109
Overcup	178	Platanus	111
Pin	148	<i>glabrata</i>	111
Post	177	<i>occidentalis</i>	111, 112 , 250
Rock Chestnut	166	Polygonella	8, 216
Sawtooth	257	<i>articiolata</i>	8, 9 , 216
Scarlet	147	Polygonum	39, 222
Schneck's Red	134	<i>achoreum</i>	64, 66 , 232
Shingle	131	<i>acre</i>	79
Shumard's	134	<i>amphibium</i>	92, 94 , 95 , 96 , 241
Spanish	156	<i>arenastrum</i>	67, 68, 222
Swamp Chestnut	168	<i>arifolium</i>	46, 47 , 225
Swamp White	170	<i>articiulatum</i>	8
White	161	<i>aviculare</i>	54, 56 , 231, 232
Willow	129	<i>barbatum</i>	88
Yellow Chestnut	162	<i>bicorne</i>	97, 98 , 247
Ostrya	201	<i>bohemica</i>	238
<i>virginiana</i>	202, 203 , 263	<i>buxiforme</i>	57, 58 , 231
		<i>careyi</i>	74, 76 , 239
Persicaria		<i>cespitosum</i>	83, 85 , 240
<i>amphibia</i>	242	<i>cilinode</i>	211
<i>bicornis</i>	243	<i>coccineum</i>	92
<i>bungeana</i>	245, 245	<i>convolvulus</i>	48, 49 , 225
<i>careyi</i>	74, 229	<i>cristatum</i>	50, 51 , 226
<i>coccinea</i>	243, 246	<i>cuspidatum</i>	72, 73 , 237
<i>fluitans</i>	92	<i>dumetorum</i>	52, 228
<i>glabra</i>	247 , 248	<i>emersum</i>	92
<i>hydropiper</i>	81, 240	<i>erectum</i>	64, 65 , 232
<i>hydropiperoides</i>	88, 241	<i>exsertum</i>	60, 61 , 232
<i>laphathifolia</i>	99, 244	<i>fagopyrum</i>	37
<i>longiseta</i>	240	<i>fluitans</i>	92
<i>longistyla</i>	97	<i>gracile</i>	211
<i>maculosa</i>	240	<i>hartwrightii</i>	92
<i>muhlenbergii</i>	92	<i>hydropiper</i>	81, 82 , 240
<i>opelousana</i>	90, 241	<i>hydropiperoides</i>	88, 89 , 241
<i>orientalis</i>	77, 239	<i>incarnatum</i>	99

Polygonum (continued)		<i>digitata</i>	154
<i>lapathifolium</i>	99, 101 , 244	<i>discolor</i>	140
<i>longisetum</i>	83	<i>ellipsoidalis</i>	143, 144 , 253
<i>longistylum</i>	87	<i>elongata</i>	154
<i>monspeiense</i>	54	<i>exacta</i>	131, 150
<i>muhlenbergii</i>	92	<i>falcata</i>	154, 155 , 254
<i>natans</i>	92	<i>faxonii</i>	161, 165
<i>neglectum</i>	69, 70 , 232	<i>fernowi</i>	161, 178
<i>opelousanum</i>	90, 91 , 241	<i>ferruginea</i>	152
<i>orientale</i>	77, 78 , 239	<i>filialis</i>	129
<i>patulum</i>	228 , 232	<i>houstoniana</i>	168
<i>pensylvanicum</i>	102, 104 , 244	<i>humidicola</i>	172
<i>persicaria</i>	83, 84 , 240	<i>imbricaria</i>	131, 132 , 133 , 253
<i>persoonii</i>	88	<i>jackiana</i>	161, 172
<i>prolificum</i>	57, 59 , 231	<i>leana</i>	132, 143
<i>punctatum</i>	79, 80 , 239	<i>leiodermis</i>	142
<i>ramosissimum</i>	62, 63 , 231	<i>leucophylla</i>	158
<i>rurivagum</i>	234, 235	<i>ludoviciana</i>	156
<i>sachalinense</i>	69, 71 , 236	<i>lyrata</i>	178, 179 , 257
<i>sagittatum</i>	44, 45 , 225	<i>macrocarpa</i>	172, 173 , 174 , 257
<i>scabrum</i>	99, 100 , 244	<i>mandanensis</i>	172
<i>scandens</i>	52, 53 , 227	<i>marilandica</i>	152, 153 , 254
<i>setaceum</i>	86, 87 , 241	<i>maxima</i>	137
<i>tenue</i>	54, 55 , 231	<i>michauxii</i>	168, 169 , 256
<i>tomentosum</i>	211	<i>minor</i>	175
<i>virginianum</i>	74, 75 , 238	<i>missouriensis</i>	143
Prince's Feather	77	<i>montana</i>	165, 167 , 254
		<i>muehlenbergii</i>	161, 254
Quercus	122, 250	<i>muhlenbergii</i>	254
<i>acuminata</i>	161	<i>neo-ashei</i>	152
<i>acutissima</i>	256, 257	<i>nigra</i>	154, 211
<i>alba</i>	158, 159 , 160 , 254	<i>nuttallii</i>	150, 151 , 253
<i>alexanderi</i>	161	<i>obtusiloba</i>	172, 175
<i>anceps</i>	131, 156	<i>olivaeformis</i>	172
<i>ashei</i>	175	<i>pagoda</i>	156, 157 , 254
<i>beadlei</i>	170	<i>pagodaefolia</i>	156
<i>bebbiana</i>	161, 175	<i>paleolithicola</i>	145
<i>bernardiensis</i>	168	<i>palustris</i>	147, 148 , 150 , 253
<i>bicolor</i>	170, 171 , 257	<i>phellos</i>	129, 130 , 253
<i>borealis</i>	137	<i>platanoides</i>	170
<i>brayi</i>	161	<i>prinoides</i>	161, 163 , 164 , 254
<i>bushii</i>	143, 154	<i>prinus</i>	165, 168, 255
<i>castanea</i>	161	<i>rubra</i>	137, 138 , 139, 253
<i>coccinea</i>	145, 146 , 253	<i>runcinata</i>	131, 140
<i>deamii</i>	165, 175	<i>saulii</i>	168

<i>schneckii</i>	134	orbuculatus	31, 32 , 218
schochiana	129, 150	patientia	24, 26 , 218
schuettei	172, 175	<i>salicifolius</i>	35, 219
shumardii	132, 135 , 136 , 253	sanguineus	212
<i>similis</i>	175	stenophyllus	222, 223
stellata	175, 176 , 177 , 257	triangulivalvis	35, 219
texana	211, 254	verticillatus	33, 34 , 218
tinctoria	140		
tridentata	131, 154	Smartweed	39, 88, 90, 97
<i>triloba</i>	154	Carey's	77
velutina	140, 141 , 142, 253	Common	103
		Creeping	86
Reynoutria	236	Pale	102
bohemica	237 , 238	Prickly	246
<i>convolvulus</i>	48	Scarlet	247
japonicus	237	Smooth	248
sachalinensis	236	Stout	250
<i>scandens</i>	50, 52	Water	97
Rheum	10, 216	Sorrel	13
rhaponticum	10, 11, 12, 216	Sheep	15
rhabarbarum	216	Sour Dock	15, 17
Rhubarb	10, 13	Unlobed	17
Rumex	13, 216	Sycamore	111, 113
acetosa	211		
acetosella	14, 16 , 217	Tear Thumb	46, 48
altissimus	27, 30 , 218	<i>Tiniaria</i>	
britannica	212, 218	<i>convolvulus</i>	48
conglomeratus	212, 219 , 220	<i>cristata</i>	50
crispus	27, 28 , 29 , 218	<i>scandens</i>	52
cristatus	35, 38 , 219	<i>Tovara</i>	
dentatus	220, 221	<i>virginiana</i>	74
<i>elongatus</i>	27	Tracaulon	224
<i>fuiginus</i>	19, 218	arifolium	44, 225
hastatulus	17, 18 , 218	sagittatum	44, 225
hydrolapathum	212		
longifolius	19, 20 , 218	Water Pepper	81, 92
maritimus	19, 21 , 218	Mild	80
mexicanus	35, 36 , 218, 219	Witch Hazel	106, 108
obtusifolius	22, 23 , 24 , 218		

Robert H. Mohlenbrock taught botany at Southern Illinois University Carbondale for thirty-four years, obtaining the title of Distinguished Professor. Since his retirement in 1990, he has served as senior scientist for Biotic Consultants Inc., teaching wetland identification classes around the country. Mohlenbrock has been named SIU Outstanding Scholar and has received the SIU Alumnus Teacher of the Year Award, the College of Science Outstanding Teacher Award, and the Meritorious Teacher of the Year Award from the Association of Southeastern Biologists. Since 1984, he has been a monthly columnist for *Natural History* magazine. He is the author of 54 books and 565 publications.

