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# **Manual of the Flowering Plants of Iowa, Part 1**

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MANUAL  
OF THE  
FLOWERING PLANTS  
OF  
IOWA

BY

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THESIS.

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## PREFACE.

THIS volume is the result of continued study of the flowering plants of Iowa during a period of seven years. The author has collected in more than thirty counties and in most portions of the state. To the collections thus obtained the author's many friends have made generous additions either by donation or by exchange. So far as possible all the literature relating to Iowa botany has been canvassed and the collections in the State University have been examined. All previous treatises have been in the nature of lists; many annotated, some not; and were mostly confined to the flora of restricted localities. In this volume all the scattered information is gathered and the author endeavors to correct previous errors, to confirm the observations already made, and to add new information obtained by personal effort.

This work is founded primarily upon the private herbarium of T. J. and M. F. L. Fitzpatrick and in this connection the author wishes to state that he is under obligations to the following parties who have sent many rare or infrequent and interesting specimens: Fred Reppert of Muscatine county, Prof. B. Fink of Fayette county, E. W. D. Holway and Herbert Goddard of Winneshiek county, R. I. Cratty of Emmet county, Prof. Pammel, C. R. Ball and Wilmon Newell of Iowa State College, J. P. Anderson of Decatur county, J. H. Mills of Henry county, and Profs. T. H. Macbride and B. Shimek of the State University, and to many others who have lent aid in a limited amount. In the determination of difficult material the author has received aid from Prof. Wm. Trelease and Prof. J. B. S. Norton of the Missouri Botanical Garden, F. Lamson-Scribner of the U. S. Department of Agriculture, and R. I. Cratty.

The question of nomenclature is as yet unsettled. For some reason the new nomenclature has not been received with much favor by Iowa botanists. Because of this the author has thought it best to pursue a conservative course. All needful changes have been adopted and by the use of synonyms both the old and new systems are presented.

The author shall be pleased at all times to receive information and material so that he may be able to extend his knowledge of a subject the pursuit of which has been a source of much pleasure.

T. J. FITZPATRICK.

LAMONI, Iowa, July 30, 1899



# MANUAL OF THE FLOWERING PLANTS OF IOWA.

## ANALYTICAL KEY TO THE FAMILIES.

Series 1. PHANEROGAMS or FLOWERING PLANTS: those producing true flowers and seeds.

Class 1. ANGIOSPERMS: plants which have the ovules contained in a closed ovary.

Subclass 1. DICOTYLEDONS: stems differentiated into bark, wood, and pith; leaves netted-veined; embryo with a pair of opposite cotyledons; flowers usually 4 or 5-merous.

Division 1. POLYPETALAE: calyx and corolla present, petals separate. Apetalous forms occur as will be noted farther on.

The following wholly artificial key is taken from various governmental publications and adapted to the Iowa flora.

A. *Stamens ten to many and more than twice the number of sepals.*

\* *Calyx entirely free from the ovary.*

Pistils many, distinct, enclosed in a hollow receptacle; leaves alternate, stipulate. Rosa, in ROSACEAE, 49.

Pistils several, contained in pits on the upper surface of a large convex receptacle. Nelumbo, in NYMPHAEACEAE, 7.

Pistils more than one, distinct, not enclosed in the receptacle.

Stamens inserted on the edge of a disk which lines the calyx-tube, distinct; anthers 2-celled. ROSACEAE, 44.

Stamens monodelphous, united with the base of the petals; anthers 1-celled. MALVACEAE, 23.

Stamens inserted on the receptacle.

Small trees; filaments shorter than the anthers. ANONACEAE, 6.

Herbs or woody climbers; filaments longer than the anthers.

Flowers dioecious; twiners; leaves alternate, palmately lobed.

MENISPERMACEAE, 7

Flowers perfect, if climbers the leaves are opposite.

Leaves peltate; petals persistent.

Brasenia, in NYMPHAEACEAE, 7.

Leaves not peltate; petals deciduous. RANUNCULACEAE, 1.

Pistils several-lobed, the ovaries united below the middle.

RESEDACEAE, 16.

Pistils several, their ovaries cohering in a ring around an axis.

MALVACEAE, 23.

Pistil solitary as to the ovary but styles or stigmas may be several.

Leaves punctate with pellucid or black dots. HYPERICACEAE, 22.

Leaves not punctate with pellucid or black dots.

Ovary simple, 1-celled, 2-ovuled; fruit a drupe. DRUPACEAE, 43.

Ovary simple, 1-celled, several-ovuled; fruit a legume.

MIMOSACEAE, 43.

Ovary compound, 1-celled; placenta central. PORTULACACEAE, 21.



- Ovary simple, 1-celled; placenta parietal, many-ovuled.  
 Leaves 2-3-ternately compound or dissected.  
 Leaves peltate, palmately lobed. RANUNCULACEAE, 1.  
 Podophyllum, in BERBERIDACEAE, 7.
- Ovary compound, 1-celled; placentae 2 or more, parietal.  
 Sepals caducous; juice milky or colored. PAPAVERACEAE, 9.  
 Sepals deciduous, 4. CAPPARIDACEAE, 16.  
 Sepals persistent, 3 or 5. CISTACEAE, 17.
- Ovary compound, several-celled.  
 Calyx valvate in the bud, and persistent; stamens monodel-  
 phous; anthers 1-celled. MALVACEAE, 23.  
 Deciduous; anthers 2-celled. TILIACEAE, 25.  
 Calyx imbricated in the bud, persistent.  
 Ovaries on many partitions; aquatics. NYMPHAEACEAE, 7.  
 Ovaries on 5 placentae in the axis. SARRACENIACEAE, 9.
- \*\* *Calyx more or less coherent with the surface of the compound ovary.*  
 Ovary 8-30-celled; ovules many, on partitions, aquatic.  
 NYPHAEACEAE, 7.  
 Ovary apparently 10-celled, each division 1-ovuled.  
 Amelanchier, in POMACEAE, 49.
- Ovary 2-5-celled.  
 Leaves alternate, stipulate. POMACEAE, 49.  
 Leaves opposite, exstipulate. SAXIFRAGACEAE, 51.
- Ovary 1-celled; ovules parietal.  
 Fleshy jointed prickly plants; petals many. CACTACEAE, 49.  
 Rough-leaved plants; petals 5 or 10. LOACEAE, 59.
- Ovary 1-celled; placenta free, central; pericarp opening by a lid.  
 PORTULACACEAE, 21.
- B. *Stamens of the same number as the petals and opposite them.*  
 Pistil solitary; flowers mostly perfect; herbs, shrubs, or woody vines.  
 Ovary 1-celled; anthers opening by valves. BERBERIDACEAE, 7.  
 Ovary 1-celled; anthers longitudinally dehiscent. PORTULACACEAE, 21.  
 Ovary 2-4-celled.  
 Calyx-lobes small or wanting; petals valvate. VITACEAE, 29.  
 Calyx 4-5-cleft valvate in the bud; petals involute. RHAMNACEAE, 29.
- Pistils 3-6, separate; flowers dioecious; woody vines. MENISPERMACEAE, 7.
- C. *Stamens of the same number as the petals and alternate with them or not more than twice as many.*  
 \* *Ovary superior, the calyx entirely free.*  
 † *Ovaries 2 or more, separate.*
- Stamens hypogynous, distinct.  
 Leaves pellucid-punctate. RUTACEAE, 27.  
 Leaves not pellucid-punctate.  
 Tree; leaves odd-pinnate; flowers paniculate. SIMARUBACEAE, 28.  
 Herbs; leaves thick, succulent; flowers cymose. CRASSULACEAE, 53.  
 Herbs; leaves not fleshy; inflorescence various. RANUNCULACEAE, 1.
- Stamens inserted on the calyx, distinct.  
 Stamens twice as many as the pistils. CRASSULACEAE, 53.  
 Stamens neither the same nor twice the number of the pistils.  
 Leaves stipulate. ROSACEAE, 44.  
 Leaves exstipulate. SAXIFRAGACEAE, 51.

- † † Ovaries 2-5, separate above, more or less united below.
- Leaves pellucid-punctate. RUTACEAE, 27.
- Leaves not pellucid-punctate.
- Trees or shrubs; leaves opposite, palmately lobed or pinnate; fruit a samara. ACERACEAE, 30.
- A small shrub; leaves opposite, 3-foliolate. STAPHYLEACEAE, 31.
- † † † Ovary 5-lobed, 5-celled; style compound. GERANIACEAE, 26.
- † † † † Ovary simple, 1-celled with one parietal placenta.
- Flowers irregular, the upper petal enclosing the others in the bud. PAPILIONACEAE, 33.
- Flowers mostly regular, the upper petal enclosed by the lateral in the bud. CAESALPINACEAE, 42.
- † † † † † Ovary 1, compound, as shown by the number of cells, placentae, styles, or stigmas.
- Ovary 1-celled.
- Corolla irregular, spurred; petals 4; stamens 6. FUMARIACEAE, 9.
- Corolla irregular, lower petal spurred; petals and stamens 5. VIOLACEAE, 17.
- Corolla regular or nearly so.
- Ovule 1; stigmas 3; small trees or shrubs with resinous or milky acid juice. ANACARDIACEAE, 32.
- Ovules 1 or 2; herbs. A few of the CRUCIFERAE, 10.
- Ovules 2 or more, central or basal.
- Petals inserted on the throat of the calyx. LYTHRACEAE, 55.
- Petals not inserted on the throat of the calyx. CARYOPHYLLACEAE, 19.
- Ovules several or many, on two or more parietal placentae.
- Leaves pellucid-punctate or black-dotted. HYPERICACEAE, 22.
- Leaves non-punctate.
- Sepals 5, unequal or only 3. CISTACEAE, 17.
- Sepals and petals 4; stamens 6. CRUCIFERAE, 10.
- Sepals and petals 5; stamens 5 or 10. SAXIFRAGACEAE, 51.
- Ovary 2-several-celled; flowers irregular.
- Stamens 6 or 8; anthers 1-celled, opening at the top. POLYGALACEAE, 21.
- Stamens 11 or 12, dehiscence longitudinal; petals inserted on the throat of the gibbous or spurred calyx. Cuphea, in LYTHRACEAE, 55.
- Stamens 5 to 8 or 10; petals mostly hypogynous.
- Ovary 3-celled; leaves opposite, digitate; trees. HIPPOCASTANACEAE, 31.
- Ovary 5-celled; leaves alternate, simple; herbs. BALSAMINACEAE, 27.
- Ovary 2-several-celled; flowers regular.
- Stamens neither the same nor twice the number of the petals.
- Petals 5; stamens collected into 3 clusters. HYPERICACEAE, 22.
- Petals 4; stamens 6, 2 shorter, rarely 2 or 4. CRUCIFERAE, 10.
- Petals 5; stamens more, distinct. ACERACEAE, 30.
- Stamens of the same or twice the number of the petals.
- Ovules and seeds 1 or 2 in each cell.
- Herbs, with perfect symmetrical flowers.
- Ovary deeply lobed, 5-celled; sepals 5. GERANIACEAE, 26.
- Ovary globose, breaking into 5 2-celled carpels, sepals 5. LINACEAE, 26.
- Shrubs or trees.
- Leaves 3-foliolate, pellucid-punctate. RUTACEAE, 27.
- Leaves palmately lobed and veined; fruit a 2-winged samara. ACERACEAE, 30.

- Leaves simple, pinnately veined, non punctate.  
 Fruit a globose or lobed pod; seeds arillate. CELASTRACEAE, 28.  
 Fruit a berry-like drupe. ILLICINEAE, 29.
- Ovules and seeds several to many in each cell.  
 Stipules caducous; leaves opposite, compound. STAPHYLEACEAE, 31  
 Stipules wanting when the leaves are opposite.  
 Stamens 10, monodelphous below; leaflets 3, obcordate. OXALIDACEAE, 27.
- Stamens distinct, hypogynous. CARYOPHYLLACEAE, 19.  
 Stamens distinct, perigynous.  
 Styles usually 2, simple, sometimes cohering. SAXIFRAGACEAE, 51.  
 Style 1; capsule often 1-celled. LYTHRACEAE, 55.  
 \* \* *Calyx-tube more or less adherent to the ovary.*
- Ours climbing annuals, with 3-forked tendrils. CUCURBITACEAE, 59.  
 Mostly erect herbs, not tendril bearing.  
 Ovules and seeds two to many in each cell of the ovary.  
 Ovary 1-celled; ovules many, basal. PORTULACACEAE, 21.  
 Ovary 1-celled; placentae 2 or 3, parietal. SAXIFRAGACEAE, 51.  
 Ovary 2-several-celled.  
 Anthers dehiscing by apical pores; style 1. MELASTOMACEAE, 55.  
 Anthers not dehiscing by apical pores.  
 Stamens inserted on a disk which fills the bottom of the calyx. CELASTRACEAE, 28.
- Stamens inserted on the calyx.  
 Stamens 4 or 8, rarely 5; style 1. ONAGRACEAE, 56.  
 Stamens 5 or 10; styles 2 or 3, distinct. SAXIFRAGACEAE, 51.
- Ovules and seeds solitary in each cell of the ovary.  
 Stamens 2 or 8; styles 1; stigma 2-4-lobed; herbs. ONAGRACEAE, 56.  
 Stamens 4 or 8; styles or stigmas 4; aquatics. HALORAGIDACEAE, 54.  
 Stamens 8, but 4 of them sterile, scale-like, styles 2; small tree. HAMAMELIDACEAE, 54.
- Stamens 4; style and stigma 1; small shrubs. CORNACEAE, 65.  
 Stamens 5; flowers umbellate, rarely capitate.  
 Fruit dry, consisting of 2 coherent carpels; styles 2. UMBELLIFERAE, 60.
- Fruit a 2-5-celled drupe; styles 2-5. ARALIACEAE, 64.
- Gamopetalous forms in polypetalous families.  
 Forms which have their petals more or less united into one piece.  
 \* *Stamens more numerous than the lobes of the corolla.*
- Ovary 1-celled, with one parietal placenta.  
 The upper petal enclosing the others in the bud. PAPILIONACEAE, 33.  
 The upper petal enclosed by the lateral in the bud. CAESALPINACEAE, 42.
- Ovary 2-celled, 2-ovuled. POLYGALACEAE, 32.  
 Ovary 3-many-celled.  
 Stamens 10, hypogynous, united below; styles 5. OXALIDACEAE, 27.  
 Stamens many, monodelphous; styles many. MALVACEAE, 23.  
 \* \* *Stamens as many as the lobes of the ovary.*
- Annuals, climbing, tendril bearing. CUCURBITACEAE, 59.  
 Shrub, with alternate simple leaves. ILLICINEAE, 29.

Apetalous forms in polypetalous families.

Forms having the corolla and sometimes the calyx wanting; calyx often petaloid.

*\* Ovary or its cells with many ovules.*

Ovary inferior, 4-celled; stamens 4. Ludwigia, in ONAGRACEAE, 56.  
Ovary inferior, 1-celled; stamens usually 8. Chrysosplenium, in  
SAXIFRAGACEAE, 52.

Ovary superior.

Pod 5-celled, 5-beaked, the beaks falling away at maturity; stamens 10.  
Penthorum, in CRASSULACEAE, 53.

Pod 3-celled, 3-valved, many-seeded. AIZOACEAE, 60.

Pod 1 or 2-celled; placentae central.

Stamens inserted on the calyx. LYTHRACEAE, 55.

Stamens hypogynous or inserted at the base of the calyx.

CARYOPHYLLACEAE, 19.

Pod 1-celled, with one parietal placenta. RANUNCULACEAE, 1.

Pods 2 or more, separate, simple. RANUNCULACEAE, 1.

*\*\* Ovary or its cells usually with 1 or 2 ovules.*

Pistils 2 or more, distinct or nearly so.

Stamens hypogynous; leaves punctate. RUTACEAE, 27.

Stamens hypogynous; leaves not punctate; calyx usually petaloid.

RANUNCULACEAE, 1.

Pistil 1, simple or compound.

Ovary inferior, 3 or 4-celled; aquatics. HALORAGIDACEAE, 54.

Ovary naked; calyx none. Callitriche, in HALORAGIDACEAE, 55.

Ovary free from the calyx; trees or shrubs.

Ovary 2-celled; fruit a 2-winged samara. ACERACEAE, 30.

Ovary 3-celled; fruit drupaceous or dry. RHAMNACEAE, 29.