Diversity of Wisconsin Asterids

... milkweeds, nightshades, and morning glories...
Asterids

(1) fused petals
(2) stamens = or less than number of petals
(3) stamens fused to petals
(4) pistil of 2 (rarely more) carpels
*Gentianaceae - gentian family*

Cosmopolitan family of 80 genera and nearly 900 species. Herbs to small trees (in the tropics) with opposite leaves.

Flowers 4 or 5 merous; pistil superior of 2 carpels; parietal placentation; fruit capsular
*Gentianaceae - gentian family

Gentiana is 5 merous, with plaits between each petal lobe

Gentiana andrewsii - Bottle gentian

Gentiana puberulenta - Prairie gentian
*Gentianaceae - gentian family

*Gentianopsis* is 4 merous with fringed petals

*Gentianopsis virgata* - fringed gentian
Gentianaceae - gentian family

Gentianella is 4-5 merous, without fringe, and without plaits between petal lobes.

Gentianella quinquefolia - stiff gentian
**Apocynaceae - dogbane family**

Mainly tropical family of trees and vines with opposite leaves. Milky latex commonly poisonous and source of medicinal drugs.

*Vinca minor* - periwinkle

Introduced ground cover, often spreading
**Apocynaceae - dogbane family**

Apocynum androsaemifolium  
Spreading dogbane  
Apocynum sibiricum  
Hemp dogbane

CA (5)  CO (5)  A 5  G 2

Flowers 5 merous, small, and with 2 separate carpels.
**Apocynaceae - dogbane family**

CA (5)  CO (5)  A 5  G 2

Fruits are follicles with cottony seeds for wind dispersal.

*Apocynum androsaemifolium*  
Spreading dogbane  
*Apocynum sibiricum*  
Hemp dogbane
**Apocynaceae - dogbane family**

Milkweeds different!
Flowers are highly modified for specialized insect pollination.

*Asclepias* - milkweeds
**Apocynaceae - dogbane family**

Corona = hood + crest
Gynoestegium = A + G
Pollinia = pollen mass

Note 2 free carpels slightly fused at top

CA (5)  CO (5)  X  5  A  5  G  2
**Apocynaceae - dogbane family**

Unusual corona structure for nectar reward

| CA (5) | CO (5) | X 5 | A 5 | G 2 |

**Corona** = hood + crest  
**Gynoestegium** = A + G  
**Pollinia** = pollen mass
**Apocynaceae - dogbane family**

Fusion of 5 stamens and top of gynoecium

\[\text{CA (5) CO (5) X 5 A 5 G 2}\]

- **Corona** = hood + crest
- **Gynoestegium** = A + G
- **Pollinia** = pollen mass
**Apocynaceae - dogbane family**

- Corona = hood + crest
- Gynoestegium = A + G
- Pollinia = pollen mass

Gland is attached to two pollinia
**Apocynaceae - dogbane family**

- CA (5)  CO (5)  X 5  A 5  G 2

- Corona = hood + crest
- Gynoestegium = A + G
- Pollinia = pollen mass
**Apocynaceae - dogbane family**

Bee removing pollinia or inserting pollinia into stigmatic cleft

<table>
<thead>
<tr>
<th>CA (5)</th>
<th>CO (5)</th>
<th>X 5</th>
<th>A 5</th>
<th>G 2</th>
</tr>
</thead>
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**Corona** = hood + crest

**Gynoestegium** = A + G

**Pollinia** = pollen mass
"Las Vegas” strategy of pollination; but when occurs, all ∞ ovules are fertilized. Typically few follicles are produced per plant. Note seeds with coma attached for wind dispersal.

**Apocynaceae - dogbane family**

Asclepias amplexicaulis - Clasping milkweed
**Apocynaceae - dogbane family**

- *Asclepias syriaca* - Common milkweed
- *Asclepias incarnata* - Swamp milkweed
- *Asclepias tuberosa* - Butterfly weed
**Rubiaceae - coffee family**

Opposite or whorled leaves

**Inter-petiolar stipules**

All species in Wisconsin are 4 and in the tropics are 5-merous

Important & large family of trees/shrubs in the pantropics

*Coffea arabica* - coffee

*Galium* - Bedstraw
**Rubiaceae - coffee family**

Opposite or whorled leaves

Inter-petiolar **stipules**

All species in Wisconsin are 4 and in the tropics are 5-merous

The family has inferior ovary.

*Galium* - Bedstraw
**Rubiaceae - coffee family**

*Galium aparine* - cleavers

Cleavers and bedstraws are numerous; separated by number of whorled leaves and fruit type
**Rubiaceae - coffee family**

*Galium obtusum*
Wild madder

*Galium lanceolatum*
Wild licorice
**Rubiaceae - coffee family**

*Cephalanthus occidentalis* - buttonbush

Only shrub in Wisconsin; restricted to riparian forest or lake edges. Note “heads” of tiny flowers.
**Rubiaceae - coffee family**

*Houstonia caerula* - azure bluets

Special concern
**Rubiaceae - coffee family**

*Mitchella repens*
Partridge berry, twin-berry

Note: paired flowers above with connate pistils; “twin” berry to right
*Solanaceae - nightshade family*

- Large cosmopolitan family of alternate-leaved herbs, vines, or shrubs with cyme inflorescences
- Important family for nasty compounds (and drugs)
- Important for source of foods (potato, tomato, pepper)

*Solanum dulcamara*
Bittersweet
*Solanaceae - nightshade family

edible fruits include . . .

_Capsicum_ - pepper

_Solanum_ - tomato & eggplant
*Solanaceae - nightshade family

drug plants include . . .

Nicotiana tabacum

Atropa belladona  Brugmansia  Datura innoxia
*Solanaceae - nightshade family

CA (5)  CO (5)  A 5  G (2)

- 5- merous flowers
- axile placentation
- berry fruited

*Solanum carolinense - Horse nettle

Capsicum - pepper

Solanum dulcamara - Bittersweet
*Solanaceae - nightshade family

- stamens often terminal pored for buzz pollination by bees
*Solanaceae - nightshade family

CA (5)  CO (5)  A 5  G (2)

• berry fruited - often with persistent calyx

Physalis alkekengi - Japanese lantern
*Solanaceae - nightshade family

*Solanum dulcamara - bitterweet
**Solanaceae - nightshade family**

*Solanum carolinense - Horse nettle*
*Solanaceae - nightshade family

Physalis virginiana
Ground cherry
Note: calyx surrounding berry
*Solanaceae - nightshade family

*Datura stramonium*
Jimson-weed (Jamestown weed)

Introduced, hallucinogenic roadside weed
... also called thorn-apple
*Solanaceae - nightshade family

**Datura stramonium**

Jimson-weed (Jamestown weed)

Introduced, hallucinogenic roadside weed

. . . also called thorn-apple

Wisconsin Medical Journal 2005

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**CASE REPORT**

**Jimson Weed Intoxication in Five Adolescents**

Steven N. Sonora, DO; Neil P. Connor, MD

INTRODUCTION

*Datura stramonium* (jimson weed) is a poisonous shrub that grows wildly throughout the United States with a high potential for abuse. The plant possesses potent anticholinergic properties, and ingestion can cause serious illness or death. Intentional ingestions may result in unintended poisonings for people who attempt to experience the anticholinergic-induced delirium that typically manifests after ingesting the leaves, stem, seeds, or tea brewed from the leaves. We report 5 cases of *D. stramonium* intoxication seen within a 3-day span as well as recent data regarding anticholinergic plant exposures.
**Solanaceae - nightshade family**

*Datura stramonium*

Jimson-weed (Jamestown weed)

Introduced, hallucinogenic roadside weed

. . . also called thorn-apple

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*Case 3*

A 16-year-old male presented with slurred, unintelligible speech and severe restlessness. Blood pressure was 130/67, and pulse was 85 beats per minute. Activated charcoal was administered. Shortly after admission to the PICU, he became aggressive, combative, and even attempted to stand on a bedside table and fly to escape from the room. Subsequently, he was sedated with intravenous lorazepam. Discharge occurred after 24 hours with normal vital signs and mental status.

*Case 4*

A 15-year-old male was brought to the ED by the police after he had been found crawling down a busy street into an intersection. He was picking at objects on his body that were not present. His only comprehensible words were obscenities. Blood pressure was 119/44, and pulse was 154 beats per minute. Skin was dry and flushed. Urine toxicology screen was negative. Activated charcoal was administered. Blood pressure and temperature remained stable. Pulse ranged from 40 to 109 beats per minute with sinus rhythm. He was sedated as necessary and discharged 40 hours later with normal vital signs and mental status.

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Wisconsin Medical Journal 2005
*Solanaceae - nightshade family

also called “moonflower”
**Convolvulaceae - morning-glory family**

Largely tropical family of 55 genera and nearly 2000 spp. Twining herbs with alternate leaves.

Convolvulus - bindweed

CA 5  CO (5)  A 5  G (2)

Flowers strongly funnelform with plicate corolla tube (with fold lines). Fruit usually capsular.

Ipomoea purpurea
Morning-glory: cultivated
**Convolvulaceae - morning-glory family**

*Calystegia sepium*
Hedge bindweed
Note: 2 large bracts below calyx

*Convolvulus arvensis*
Field bindweed
Note: no floral bracts
Cuscuta (Cuscutaceae) is actually part of the Convolvulaceae!

*Convolvulaceae - morning-glory family*

- Twining habit (for support) has gone parasitic (support + food + water; no chlorophyll)

*Cuscuta* spp. - dodder
*Cuscutaceae - dodder family

*Cuscuta gronovii
Common dodder

*Cuscuta glomerata
Rope dodder