



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Identification Features of Asteraceae & Application to Selected Species

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Canada

Learning objectives for this course

1. Become familiar with the structures and features of the Asteraceae family that analysts use to gather information about their identity.
2. Know how to apply botany knowledge to distinguish selected species.

Introduction to *Asteraceae*: Diversity of form – fruits (achenes)

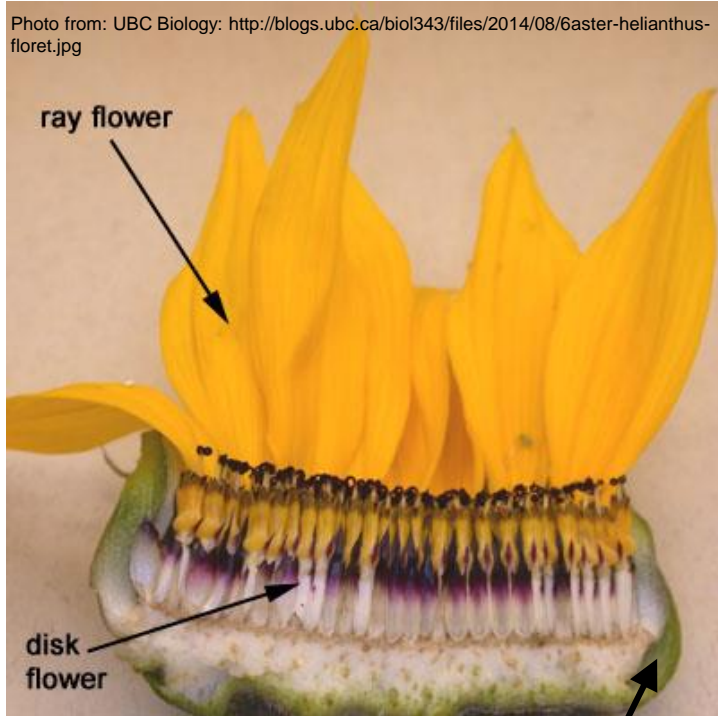


Introduction to *Asteraceae*: Flower to fruit

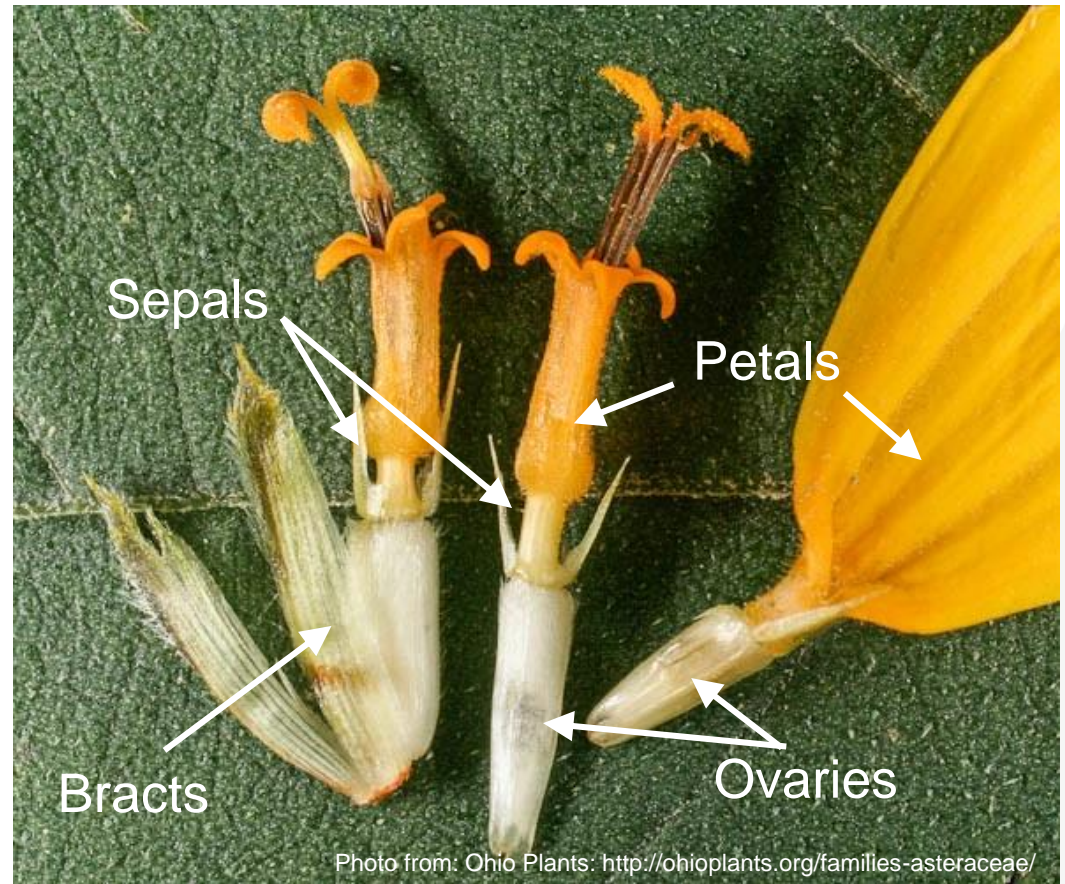


Photo from: National Park Service:
<https://www.nps.gov/teachers/classrooms/beeweek-day2.htm>

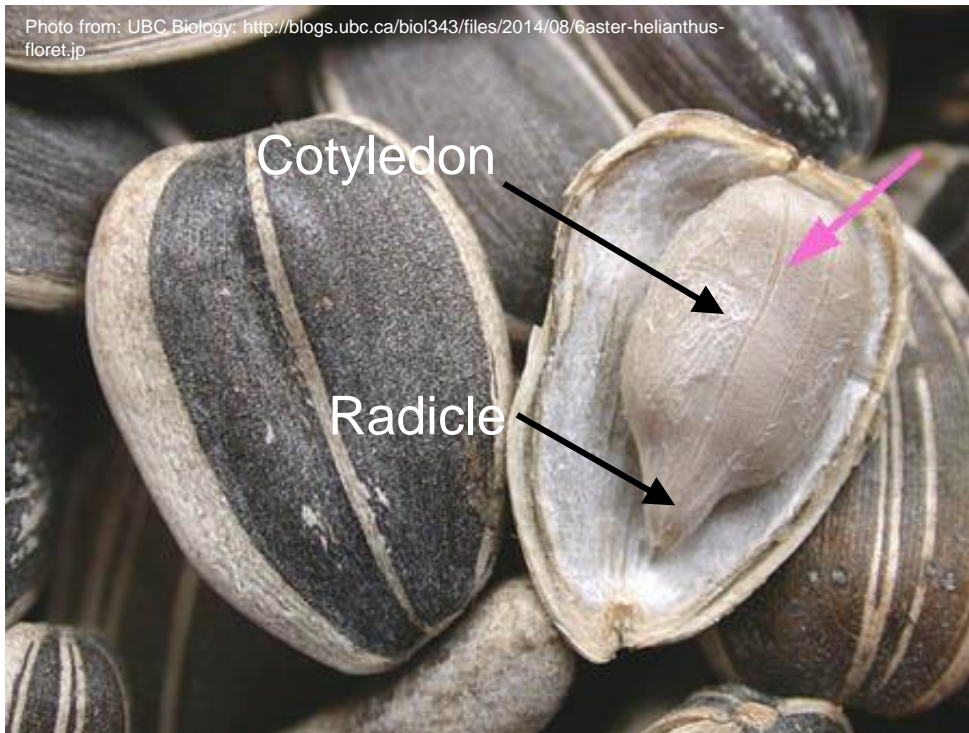
Introduction to *Asteraceae*: Flower to fruit



Bracts



Asteraceae Fruit Anatomy



Recognizing *Asteraceae* Fruit

Scar from
flower
parts



Absinthe wormwood
(*Artemisia absinthum*)

Pappus



Spotted knapweed
(*Centaurea stoebe*)

Remnant peg



Povertyweed
(*Iva axillaris*)

Asteraceae Fruit Identification

Features: Shape



Angular



Black-eyed Susan
(Rudebeckia hirta)

Lens



Wild sunflower
(Helianthus annuus)


Round



Orange hawk-bit
(Hieracium auranticum)

***Asteraceae* Fruit Identification**


Features: Surface, Decorations & Quiz #1




**Dull /
Fibrous**



**Smooth /
Varnished**



**Corky/
Bubbled**



**Ribs /
Ridges /
Nerves /
Grooves**




Hairs



**Oil ducts /
glands**

Asteraceae Fruit Identification

Features: Surface, Decorations & Quiz #1




Thistles
(*Cirsium* spp.)

Sunflowers
(*Helianthus* spp.)



Thistles
(*Carduus* spp.)

Knapweeds
(*Centaurea* spp.)



Mayweeds
(*Anthemis* spp.)



Sowthistles
(*Sonchus* spp.)


Hawksbeard
(*Crepis* spp.)

Dandelion
(*Taraxacum* spp.)



Groundsels
(*Senecio* spp.)

Goldenrods
(*Solidago* spp.)

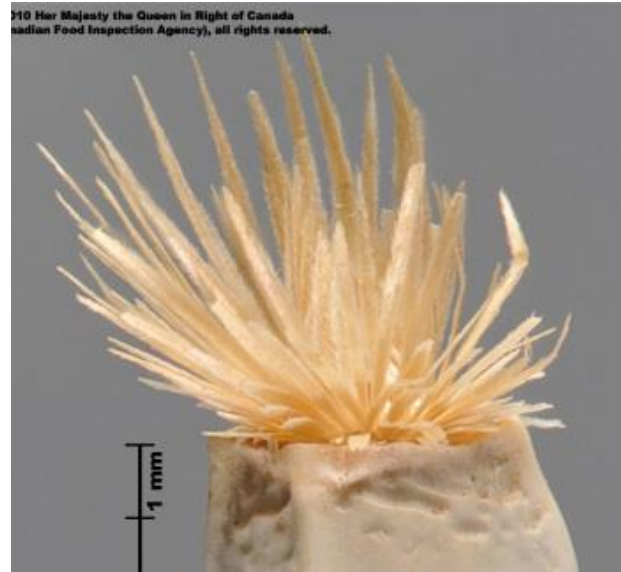


Chamomiles
(*Tripleurospermum*
spp. & *Matricaria*
spp.)

Tansy
(*Tanacetum* spp.)

Asteraceae Fruit Identification

Features: Pappus (Pappi)



Thread-like Bristle

Goldenrods (*Senecio* spp.)
Fleabanes (*Erigeron* spp.)

Flat Bristle

Knapweeds (*Centaurea* spp.)
Safflowers (*Carthamus* spp.)

Feather-like (Plumose)

Cat's-ear (*Hypochaeris* spp.)
Thistles (*Cirsium* spp.)

Asteraceae Fruit Identification

Features: Basal attachment points



Ring

Yarrows (*Achillea* spp.)
Goldenrods (*Solidago* spp.)
Wormwoods (*Artemisia* spp.)

Small notch (basal)

Thistles (*Cirsium* &
Carduus spp.)
Sunflowers (*Helianthus* spp.)

Large notch (basal or side)

Knapweeds (*Centaurea* spp.)

Asteraceae Fruit Identification

Features: Top attachment points



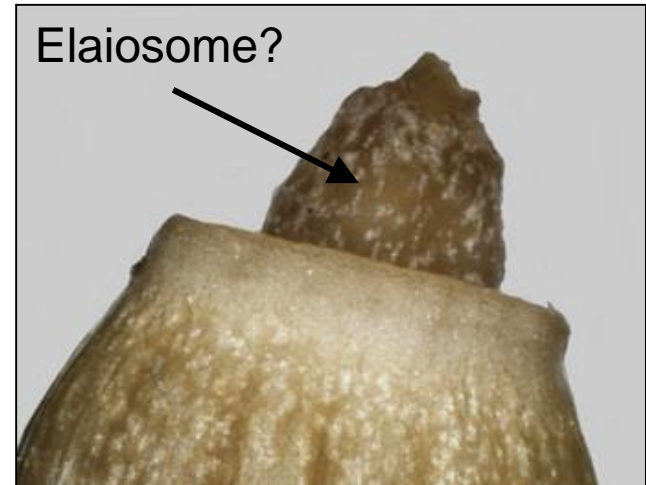
Scar

Yarrows (*Achillea* spp.)
Goldenrods (*Solidago* spp.)
Wormwoods (*Artemisia* spp.)



Collar and small peg

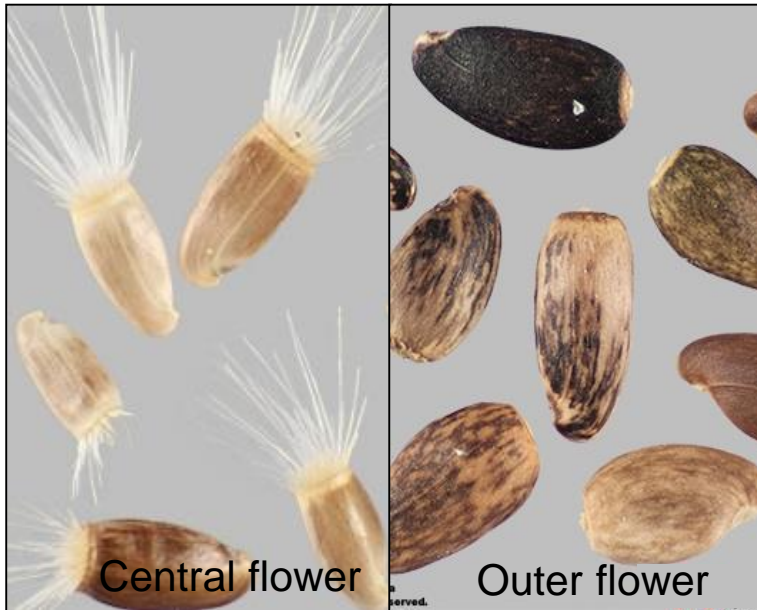
Groundsels (*Senecio* spp.)
Knapweeds (*Centaurea* spp.)
Chamomiles (*Matricaria* &
Tripleurospermum spp.)



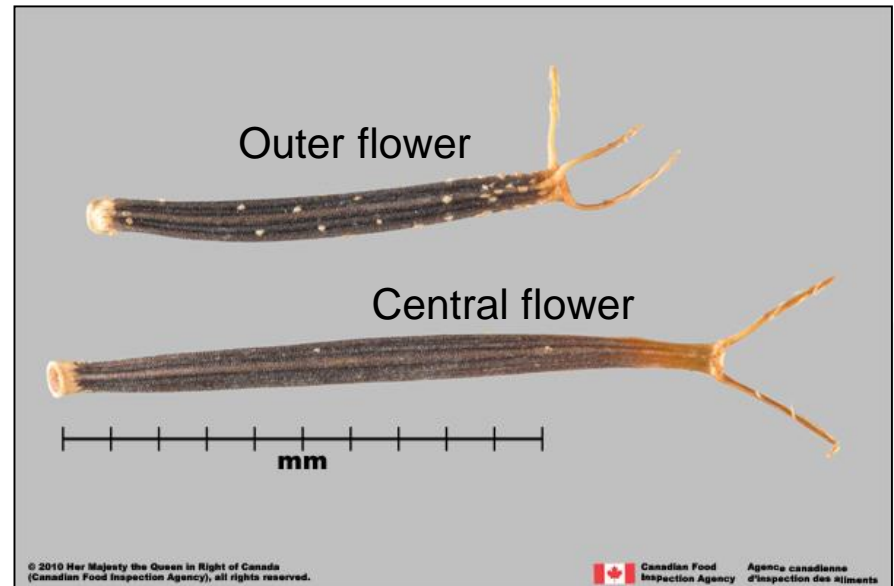
Collar and large peg

Thistles (*Cirsium* & *Carduus* spp.)

Asteraceae Fruit Identification Surprises: Dimorphic achenes



Yellow star-thistle
(*Centaurea solstitialis*)



Beggarticks
(*Bidens alba*)

Asteraceae Fruit Identification

Surprises: Bur fruits



Perennial ragweed
(*Ambrosia psilostachya*)

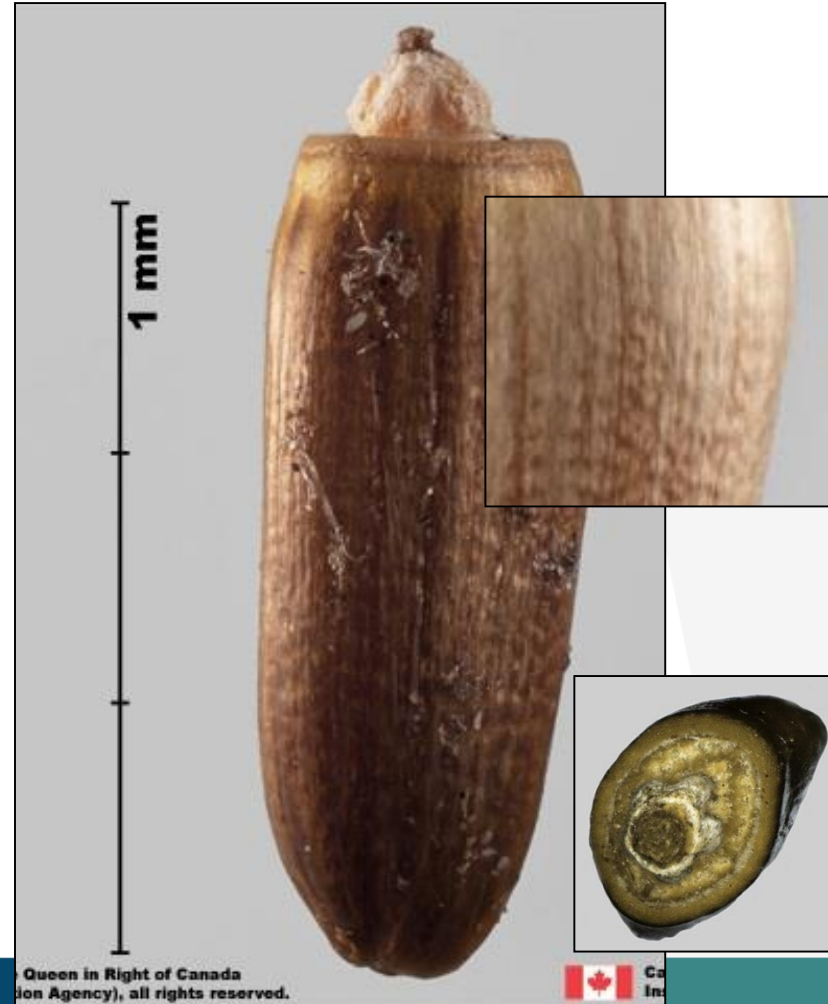


Cocklebur (*Xanthium strumarium*)

Using *Asteraceae* Fruit Features for Identification & Quiz #2





- 2 attachment points (scars)?
- Shape
- Surface
- Decorations?
- Pappus?
- Type of base scar
- Type of top scar



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Using *Asteraceae* Fruit Features for Identification

	Canada thistle (<i>Cirsium arvense</i>)	Nodding thistle (<i>Carduus nutans</i>)
		
Shape	<ul style="list-style-type: none"> • Longer than wide; lens-shaped in x-section; more narrow than nodding thistle 	<ul style="list-style-type: none"> • Longer than wide; lens-shaped in x-section; wider than Canada thistle
Surface	<ul style="list-style-type: none"> • Dull/ fibrous; brown-coloured; thin longitudinal lines (grooves) 	<ul style="list-style-type: none"> • Smooth/ varnished; brown-coloured; thin longitudinal lines and wavy transverse ridges
Base scar	<ul style="list-style-type: none"> • Small notch 	<ul style="list-style-type: none"> • Small notch
Top peg	<ul style="list-style-type: none"> • Collar and large peg, but thinner than nodding thistle 	<ul style="list-style-type: none"> • Collar and large peg, but wider than Canada thistle

Thank you!

Acknowledgements:

Seeds for imaging: National Seed Herbarium

Questions/comments send to:
SSTS@inspection.gc.ca

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