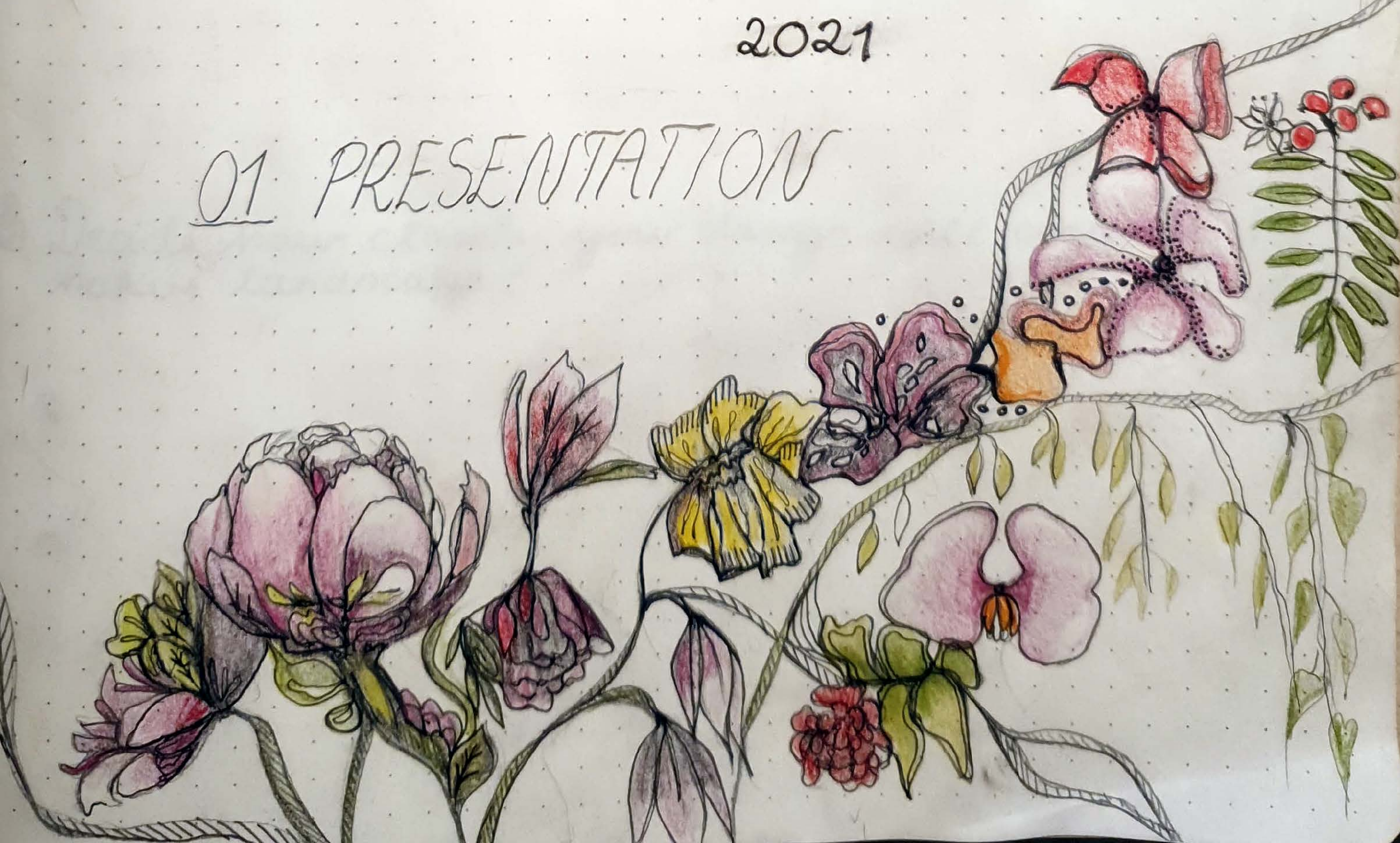




PLANTING  
DESIGN AND  
HORTICULTURAL  
ECOSYSTEM  
MANAGEMENT  
2021

01 PRESENTATION





Name "Akelei" (German)  
aquila = eagle

# BOTANICAL DESCRIPTION OF "Aquilegia vulgaris"

"Columbine"  
"Granny's bonnet"

## Introduction



- "Aquilegia vulgaris" (Die Gemeine Akelei)/European columbine) is a flowering herbaceous perennial plant, and a species of columbine, native in Europe. Plant family is (Aquilegia) Ranunculaceae  
buttercup family "Salei"
- Perform best in full sun to part shade, and the soil should be average, medium moisture, well-drained soils. Dislikes strongly poorly drained soils!
  - Attracts hummingbirds and butterflies, and rabbits and deer ignore the plant. Flowers are pollinated by bees/hummingbirds.
  - Short-lived, clump-forming; late spring to mid-summer flowering.

• Height: 30-90 cm	• Water needs: Average	• Soil: pH: Acid
• Spread: 30-60 cm	• Maintenance: Low	Alkaline
• Spacing: 37-50 cm	• Characteristics: Cut flowers, Showy	Neutral

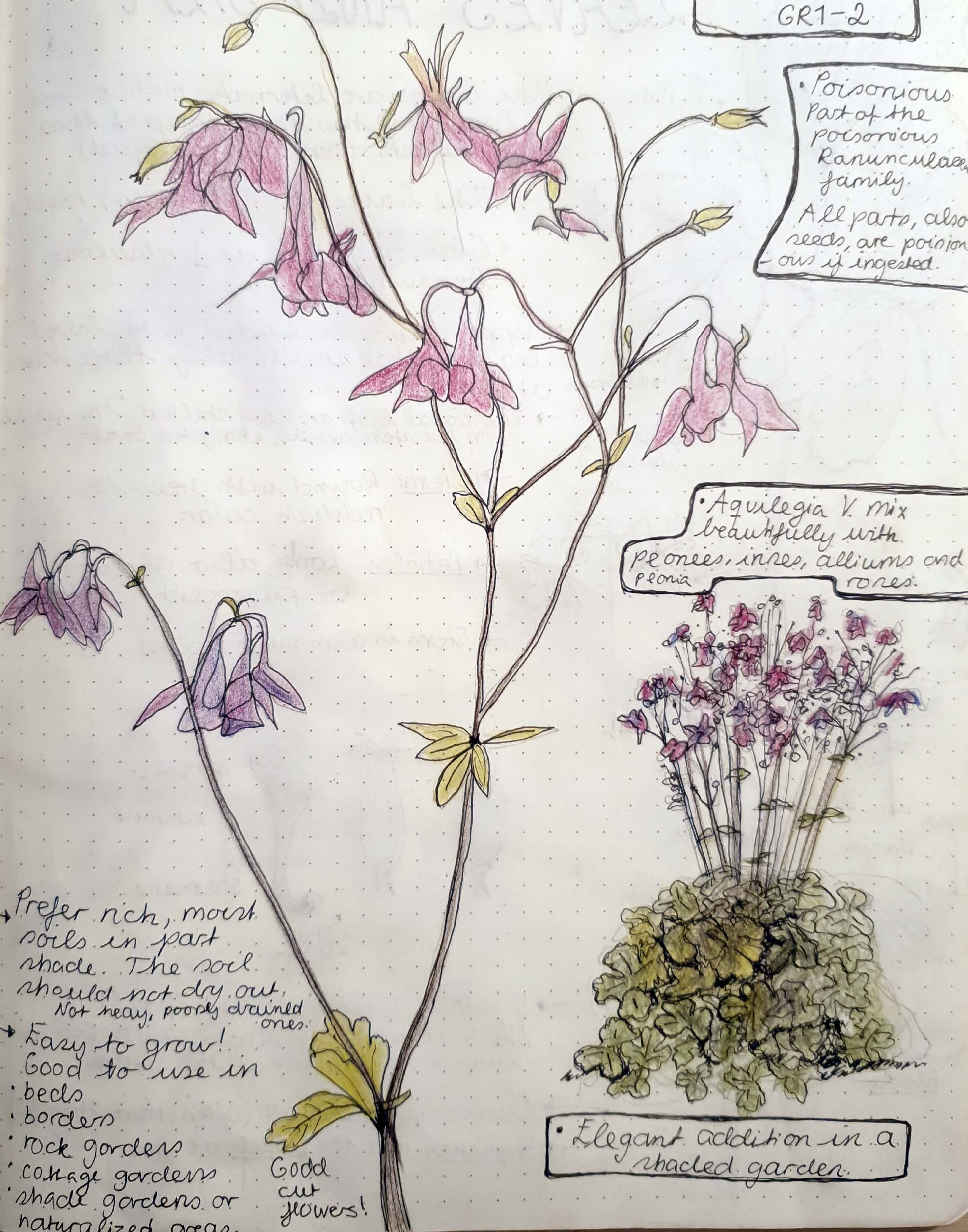


Lebensbereich  
GR1-2

• Poisonous  
Part of the  
poisonous  
Ranunculaceae  
family.  
All parts, also  
seeds, are poison-  
ous if ingested.

• Aquilegia V. mix  
beautifully with  
peonies, irises, alliums and  
peonias

• Elegant addition in a  
shaded garden.



→ Prefer rich, moist  
soils in part  
shade. The soil  
should not dry out.  
Not heavy, poorly drained  
ones.

→ Easy to grow!  
Good to use in  
• beds  
• borders  
• rock gardens  
• cottage gardens  
• shade gardens or  
naturalized areas.

Good  
cut  
flowers!



# LEAVES AND STEM



- The leaves are biternate, medium-green. Each leaf has three group of three lobed leaflets. (ternately compound)

- The leaves are gray-green, rounded

- Glabrous <sup>(smooth)</sup> above and glaucous beneath, (Hairy)

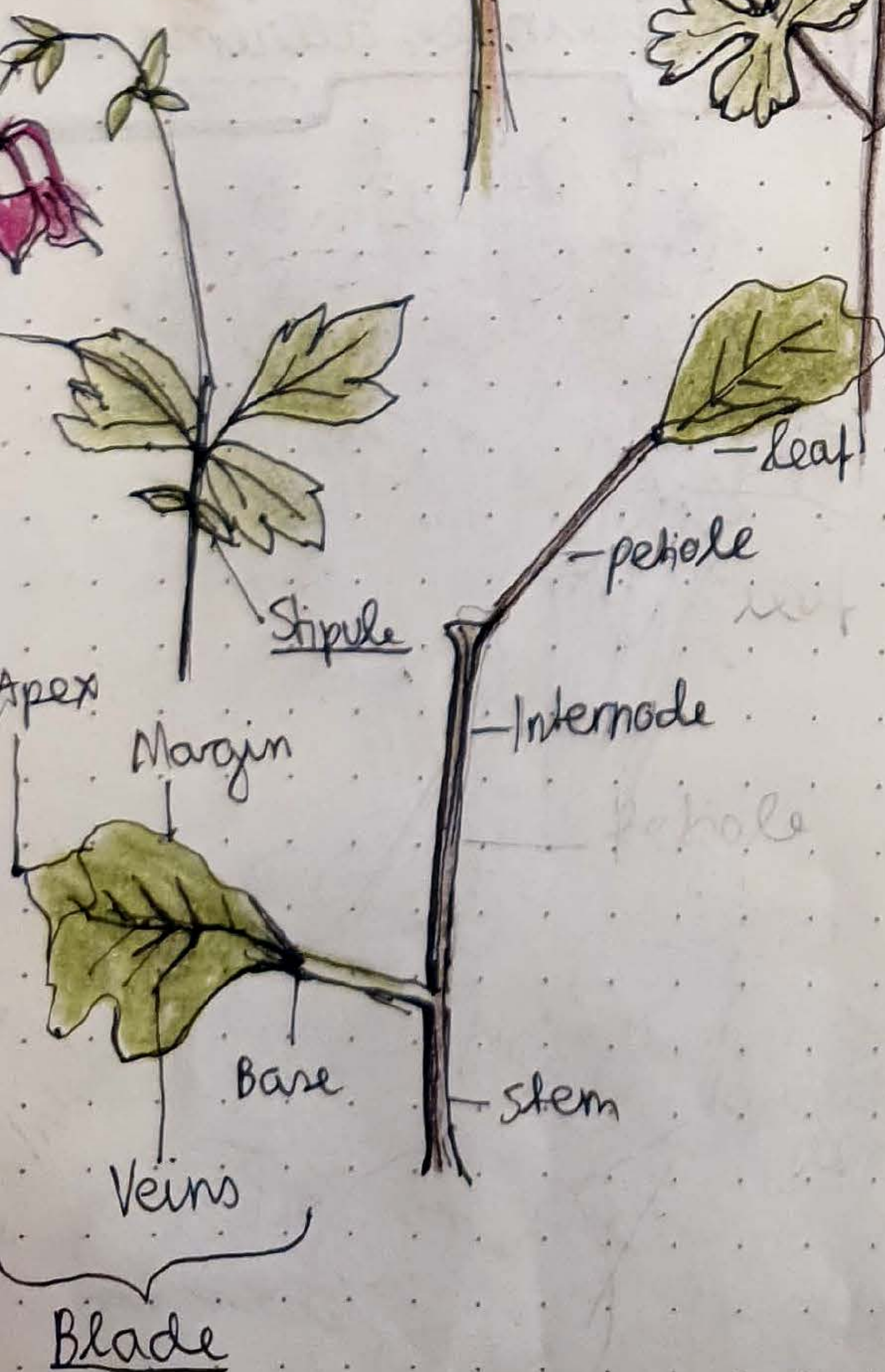
→ Upper leaves are divided into lobed leaflets that are usually three-lobed at the tips.

→ The basal leaf are long stalked, the leaflets on the stem sessile, elongated oval

→ Stem: Round with green to reddish color.

→ Petioles: Long, also glabrous or pubescent (short hairs)

→ Stem is almost hairless.



→ 5 petals, 5 petals-like sepals. The 5 nectar leaves looks like a bell and have nectar glands at the bottom.

→ Numerous Stamens (Often more than 50)

→ 5 pistils and the Carpels are free.



# FLOWER - FORM

May - June, 5 cm (dia)

- The flowers can consist of various shades of purple, blue, pink and white. 3-5 cm in diameter.

- They are pendent or horizontal with hooked spurs (short-hooked)

- Spreading sepals. Bell shaped spurred flowers.

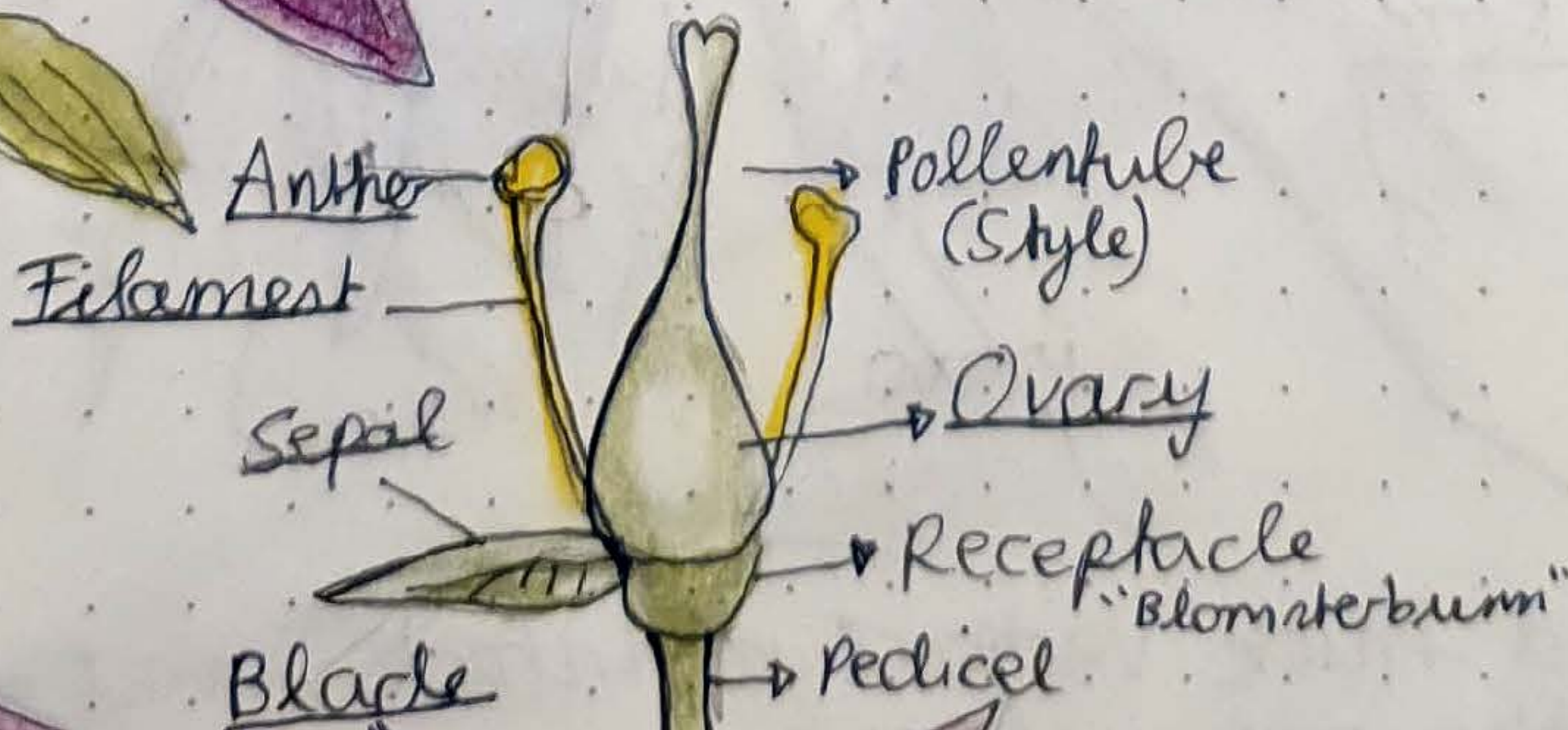
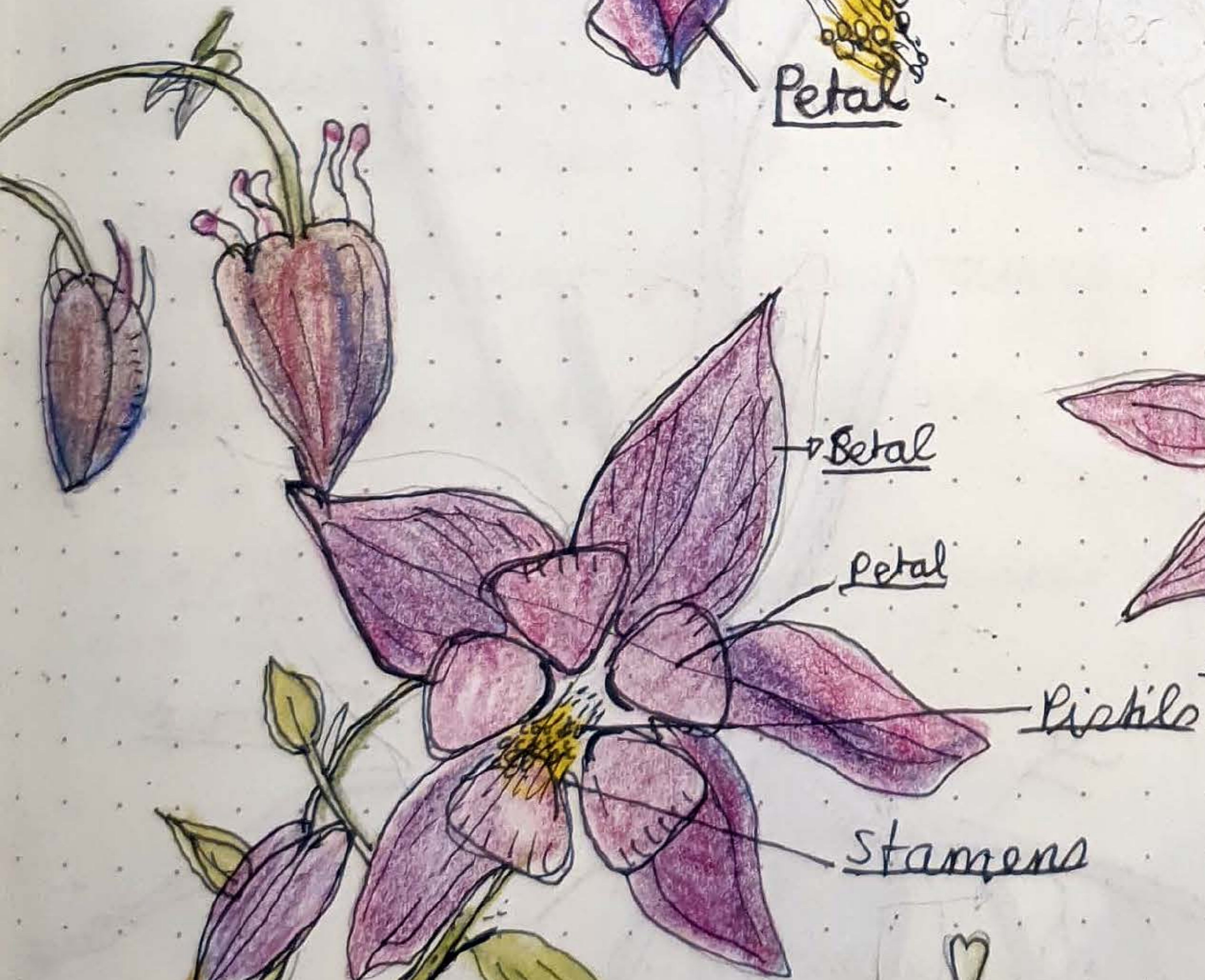
- Existing a wide variety of cultivars featuring flowers that are single or double, short-spurred or spurless.

- The flower is around and hangs downward from its stalk

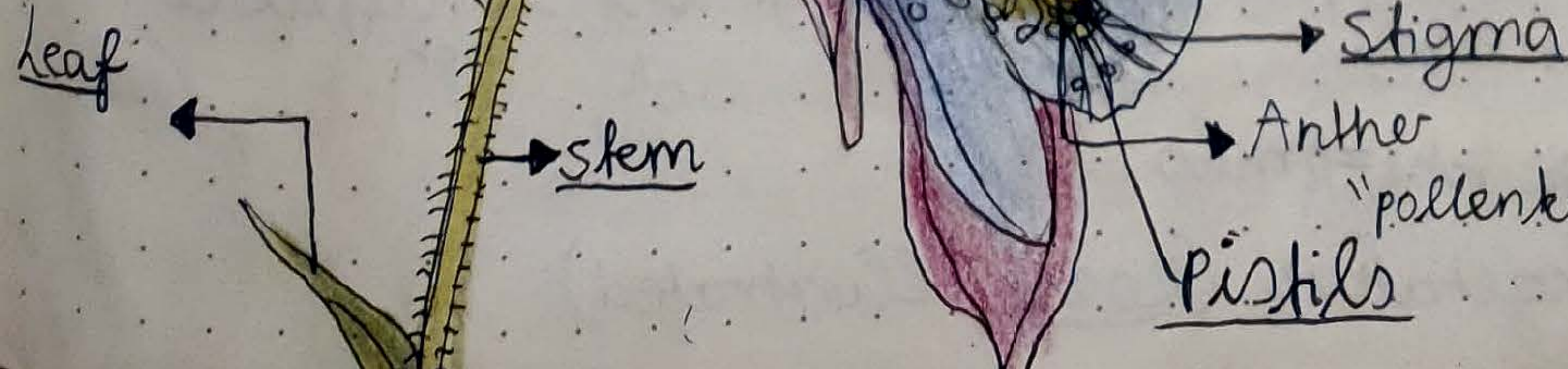
- Long stamens and styles (pollentube)

- Hermaphrodite (Both male and female organs). The flowers are terminal

- May - June to stem and branches.



SPUR-FORM



## SPUR (form)

- Aquila = eagle

The spur is curved in similar way to the beak and claws of an eagle.

- Outgrowths of tissue on different plant organs. Often referred to the nectar spurs in flowers.

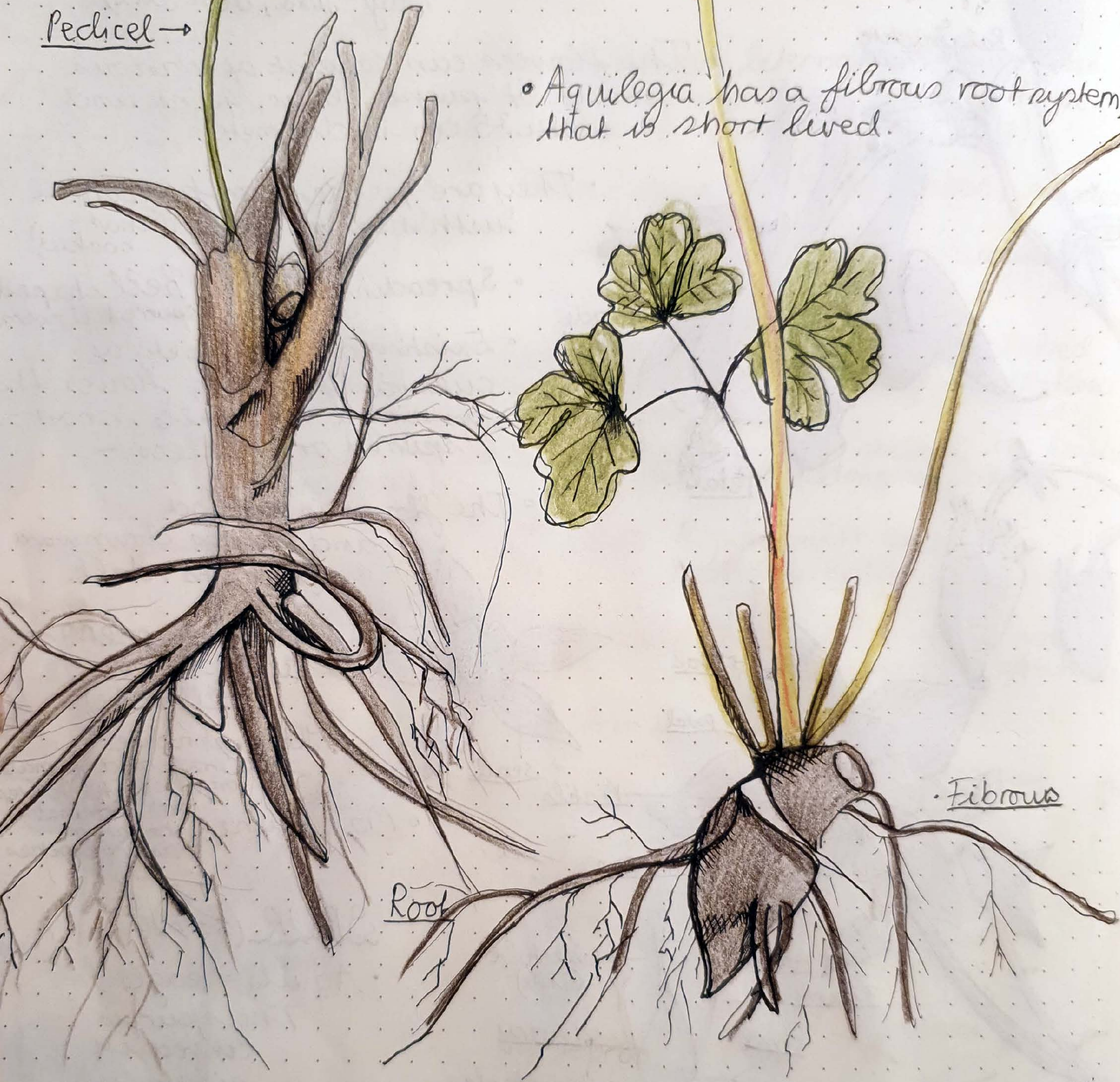
- Hollow extension of a part of a flower.



# ROOTS

Pedicle →

• Aquilegia has a fibrous root system that is short lived.



- The plant has a thick vertical rootstock, and therefore doesn't spread with the root system.
- Columbine spreads by seed dispersal. Grows itself by seeds.
- Self-fertilization (hermaphroditic) (The plant is capable of vegetative reproduction).  
not
- Roots forming thick rhizomes.
- Hard to propagate vegetative (Roots illustrated)

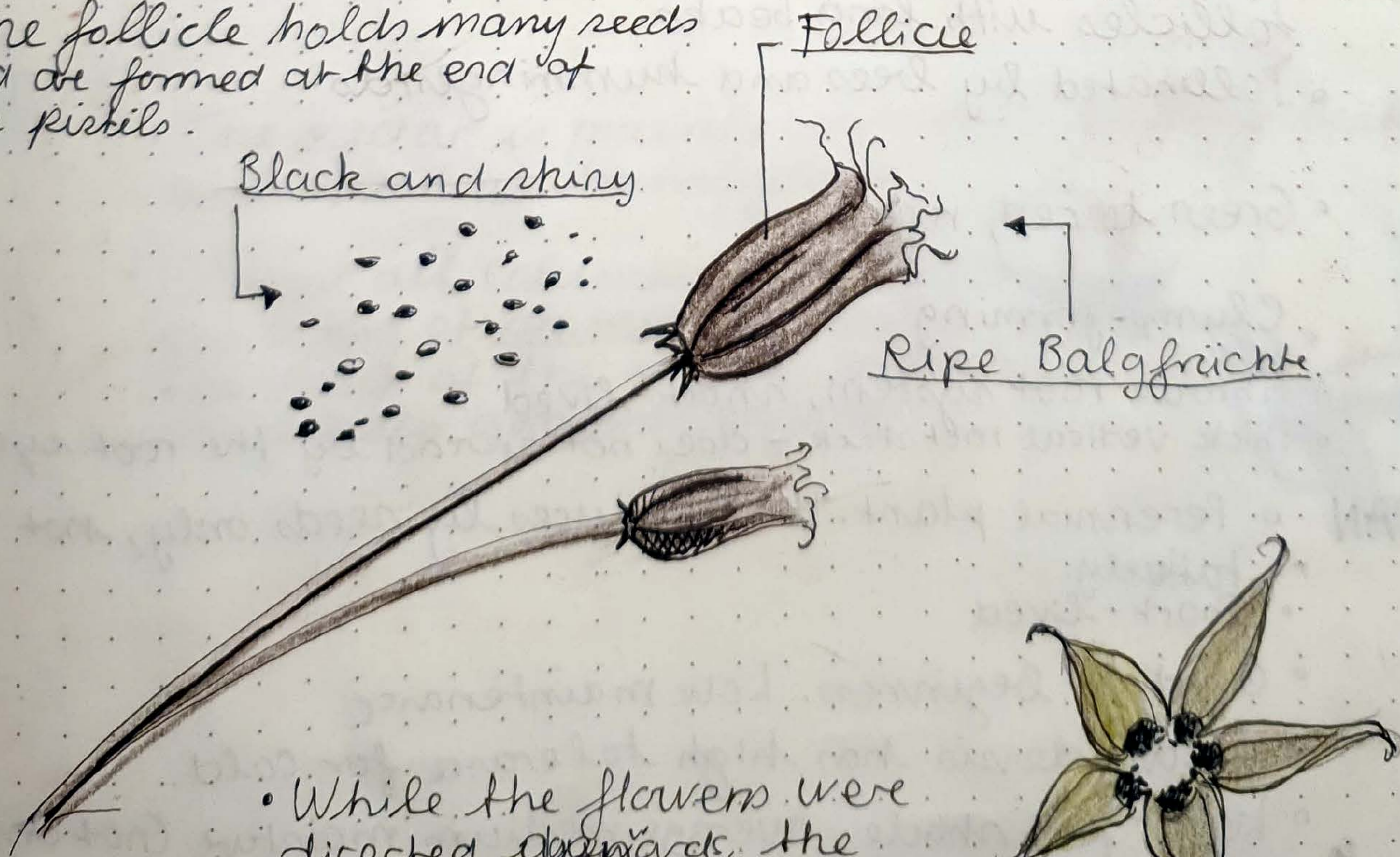


# SEEDS

- Columbine spreads by seed dispersal and the seeds, which are shiny and black, sit in apocarp <sup>follicles</sup> pod pods that opens when the seeds are ripe (modne) (Belg kapsler)
- The seeds are then sprinkled ("dregger") on the ground and left near the mother plant, but they can also be spread by the wind further away to new places (or animals)

1. During the ripening (modning) process (July), the fruit walls dries out.
2. The drying process causes the Balgfruchte to open.
3. Wind, animals carries the seeds away.

• The follicle holds many seeds and are formed at the end of the pistils.



- While the flowers were directed upwards, the follicles are upright!!
- Contain up to 2,5 mm long, shiny, black seeds.



# TOXICITY

## NON-HUMAN

Little importance as a food source to most herbivores (domesticated or wild) because of its toxicity.

Nectar → Good for bees/hummingbirds.

Foliage → Food source for a lot of insects.

Little impact as forage for animals because of the toxicity, but also because of the predominate location on steep and rocky surfaces.

Mildly-moderate toxic to most herbivores.

## HUMANS

No known toxicity issues with humans, but should be handled with care since this plant belongs to the Ranunculaceae - which has a lot of species with known toxicity issues for humans and animals.

The seeds, roots should not be consumed. The leaves are toxic unless well-boiled.

The flowers are edible.



# PHYSICAL CHARACTERISTICS

- 30-60 cm
- 45 cm wide
- Strong rhizome

## LEAF

- Green (medium), biternate, gray-green
- Each leaf has three group of three lobed leaflets = Ternately compound
- Glabrous above, glaucous beneath. (hairy)
- STEM: Round, green to red, almost hairless.
- Petioles: Long.

## FLOWER

- Hangs downward from its stalk.
- Five petals, five petal-like sepals
- Strongly visible stamens and styles.
- Nectar spur (long): Nectar glands at the bottom
- The sepals has an ovate shape.
- No scent?
- After flowering, each flower is replaced five pod shaped follicles with long beaks.
- Pollinated by bees and hummingbirds.



"beak"  
↑

## STEM

- Green to red, round.
- Clump-forming

## ROOTS

- Fibrous root system, short-lived
- Thick vertical rootstock - does not spread by the root system.

## LIFE SPAN

- Perennial plant. It reproduces by seeds only, not vegetatively.
- Short-lived

## CARE

- Good for beginners. Low maintenance
- A. canadensis has high tolerance for cold.
- Light - part shade, average medium moisture (not dry out!)
- Good in shaded gardens.
- High tolerance for frost



## OTHERS

- Little importance as food source. (Toxic)
- Nectar for bees/H. birds.
- Foliage is a good food source for insects.
- The fruit has several (5-15) follicles which are semi erect and slightly connate downwards.

## USE

- Flowers from May - June
- After flowering, the foliage becomes pale.  
→ best cut-off and the plant will grow fresh foliage.
- They flower year after year.

## SEEDS

- Flowers up, follicles downward
- 2,5 mm (max) black shiny seeds.

↔ opposite!

## PROPAGATION

- Hard to propagate (Root) vegetatively.
- Hermaphrodite.
- Seed dispersal

## PLANT

- The nectar is mainly consumed by long-beaked birds such as hummingbirds.
- Almost all columbine (*Aquilegia*) has a ring of staminodia around the base of the stigma, which may help against insects.





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