Ch 29 Plant Structure & Funct

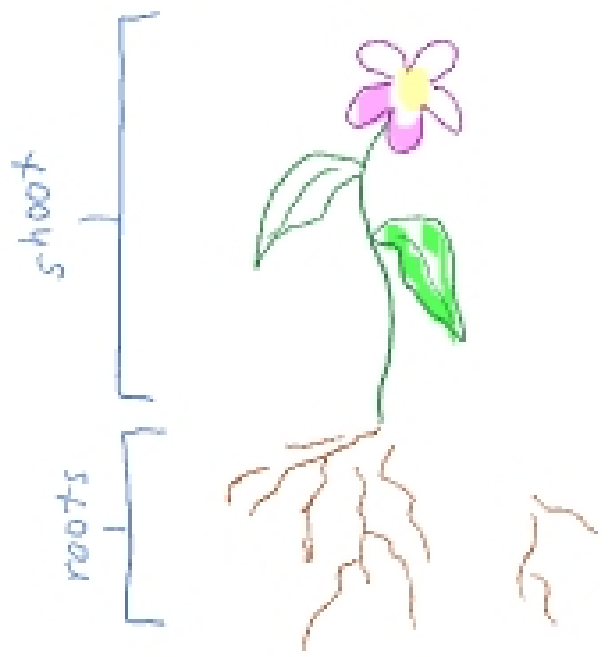
Wednesday, October 1, 2
3:44 PM

* Benefits & problems of plant adaptations

① Phylogeny of Plan

Land Plants
- monophyletic
- decended from green alg
- "vascular plants"
  - > 95% of land plant
  - > mostly angiosperms
    - ↳ def flowering plants (w/f lowers or
  - > have true roots & true le
  - > Maintain hydration & photosynthesize in ma

Plant Anatomy



② Shoot

- 3 major tissues
  - epidermis
  - Mesophyll
  - veins
- CO_2 uptake in leave
  - cuticle
    - >Stomata & guard ce
      - * open/close to release/ take in
      - * hydromechanical valv
      - * based on concentration of solutes in gu
      - * Default state = closed
        - opening requires ATP (made by mitoche
    - > stoma in Angiosperms
      - * can open larger b/c swelling /shrinking in g
      - cells creates a response in adjacent cell
    - > Why do stomata open/clos

* Let in CO_2 & let O_2 e
- C3 Photosynthesis (basic fe
  > light & Calvin cycle in one
  > O_2 builds up when stomata
  > Rubis co
    * key enzyme
    * binds to CO_2 or
      · CO_2 → carbohydrates
      · O_2 → photorespiration
        ↳ DESTRUCTIVE apart (tears) glu
- CAM Photosynthesis
  * Adaptation deals w/ H_2O loss by opening st
  > Stores CO_2 @ night (as
    > Advantage = dry/sunny elim
    > Disadv. = limited CO_2 st
- C_4 Plants
  > CO_2 stored as C
  > Cell fixation & light cycles in differer
  > Different leaf structu
    * 2 types of ce
    * O_2 production & glucose sepa
  > Adv. = ↓ photorespiration
  > Disadv. = costs more ATP th

Stems

- Xylem
  > dead @ maturity
  > Reinforced w/ lignin
  > tracheids (unicellular)
  > vessels (multicellular)
  > forces that pull wat
    · continuos column of
    · evaporation, pulls water
    · Hydrogen bond
      - cohesion / adhe
  > Risks
    · collapse
    · cavitation (air bubbl

- xylem ar
- force ir
- xylem risks

- phloem
  > "source to sink
    · sources store carbs (leaves, tu
      - sugar brings H_2O = ↑ in turgor p
    · sinks need carbs (roots, developing

- Removal = ↓ turgor press
· transport can be ↑ C
- goes to wherever "sink

Roots

· ↑ in surface area of pl
↳ root hairs expand SA of roots to ↑ H_2O
· Rhizosphere — soil layer surrounding
> many microbial populations
↳ aid in decomposition
> Symbiotic Relationship
* roots release carbs to microbial