Gametophyte Development

Objectives

- Review alternation of generations
- Review floral morphology
- Examine gametophyte development
  - Male
  - Female
- Endosperm development

Flower Morphology

1. Pedicel = flower stalk or peduncle
2. Sepals = Calyx
3. Petals = Corolla
4. Stamens = Filaments, Androecium
5. Carpel = Stigma, Style, Ovary

Stamen & Anther Morphology

- Anther
- Filament
- Anther Lobe = Microsporangium

Sporic Meiosis

Key: Haploid  Diploid

- Spores → Meiosis → Spore-forming cell
- Gametophytes (haploid) → 2n Sporophyte (diploid)
- 2n Zygote → Syngamy
Male Gametophyte development
Early Microsporogenesis

- Sporogenous Tissue with microsporocytes
- Tapetum
- Anther lobe wall

Microsporogenesis

- Meiosis I
- Meiosis II
- Mature pollen grains

Pollen grain wall morphology

- Intine
- Exine
- Sporopollenin

Pollen grain aperture morphology

1. Pores
2. Fissures
Papers related to pollen tube growth


Heslop-Harrison, J (1987) Pollen Germination and Pollen-Tube Growth. International Review of Cytology, Vol 107 PP1-77. >From the above review: "pollen germination and pollen tube growth...are seen from the forgoing to be matters of daunting complexity-biochemically, physiologically and structurally


Pollen Development in Angiosperms

Microsporogenesis
- Produces microspores
- Haploid microspores form
- Microspores develop into pollen grains

Microgametogenesis
- Mitosis of microspore
- Production of generative cell and tube cell
- Mitosis of generative cell → 2 sperm nuclei

Summary: Microspore (Pollen), Microgametophyte & Sperm Development

Two developmental events
1. Microsporogenesis
   - Diploid microsporocytes → meiotically
   - Haploid microspores form
   - Microspores develop into pollen grains

2. Microgametogenesis
   - Mitosis of microspore
   - Production of generative cell and tube cell
   - Mitosis of generative cell → 2 sperm nuclei