DIVERSITY OF SPERMATOPHYTE: GYMNOSPERMS

[Introduction]




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Spermatophyta → Seed Plants

- Produce seeds in their life cycle
- Seed:
  - Young sporophyte embyo (2n)
  - Develop from zygote
  - surrounded by nutritive tissue
  - covered by seed coat

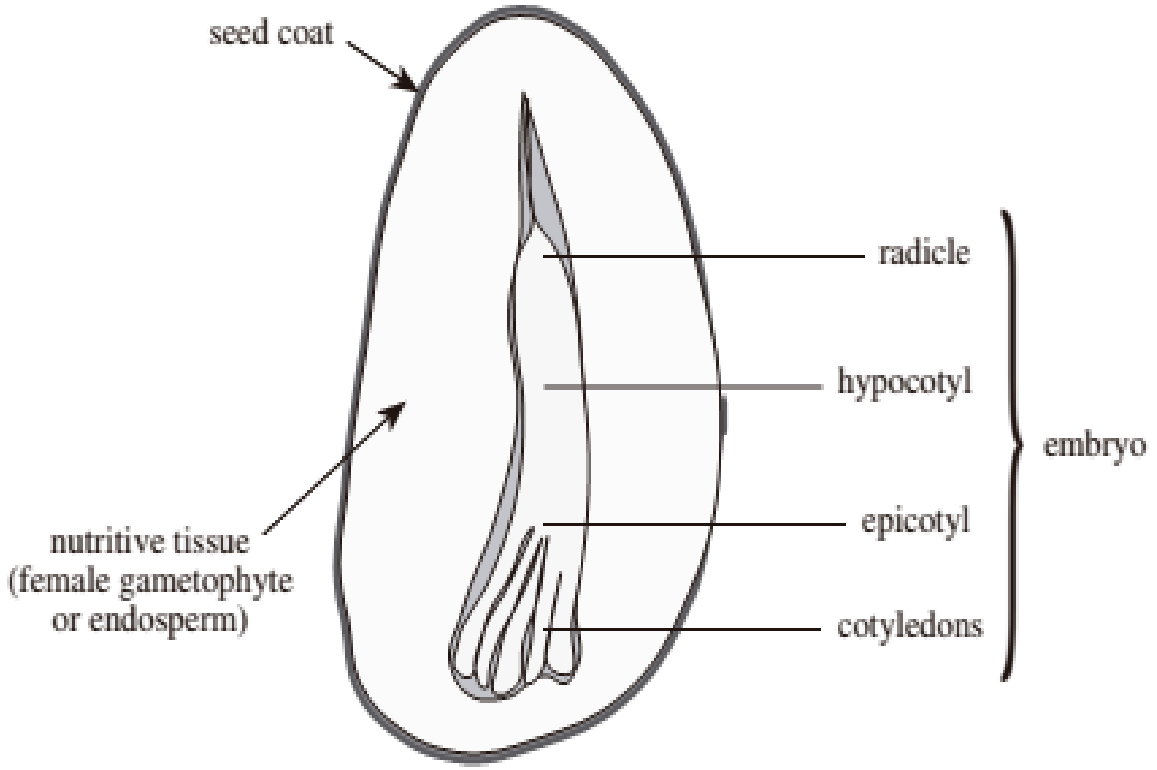
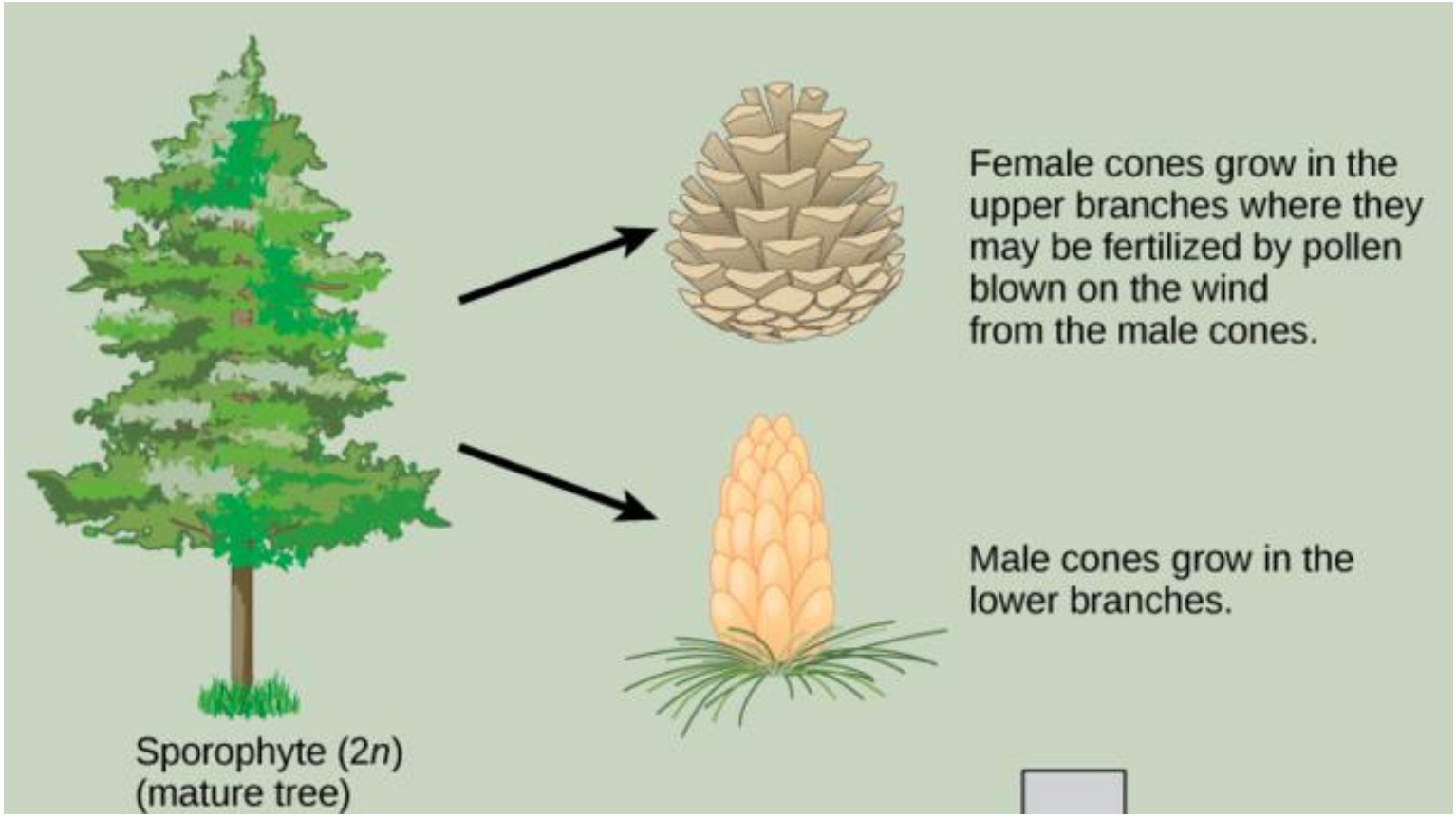
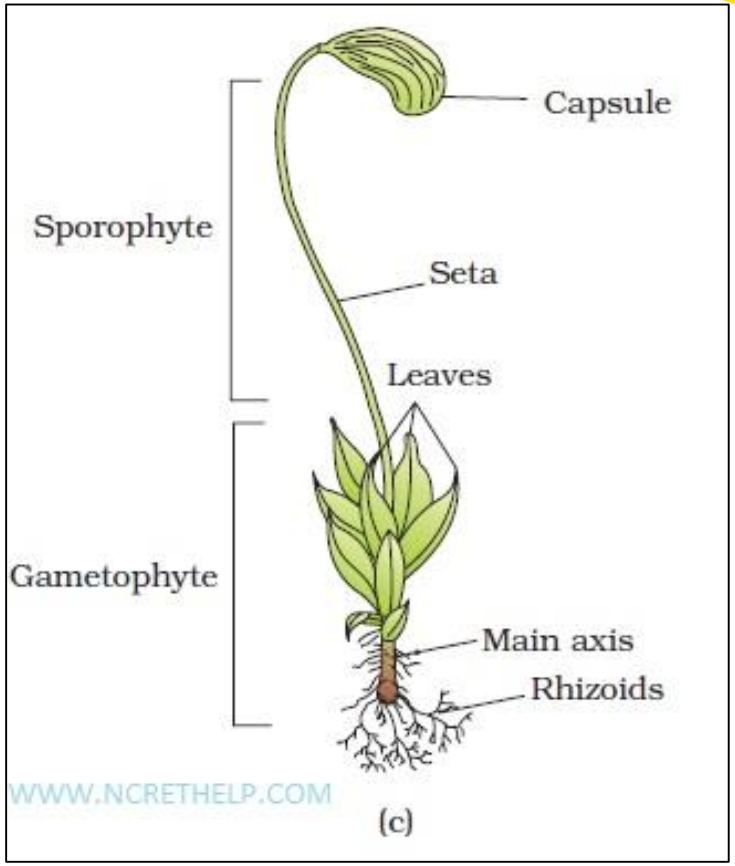


FIGURE 5.6 Morphology of a seed. *Pinus* sp. illustrated here.

Seed Plants vs Non Seed Plants





The female gametophyte in seed plants remains attached to and nutritionally dependent upon the sporophyte.

The reverse condition as is found in the liverworts, hornworts, and mosses

Life Cycle of Heterosporus Plants

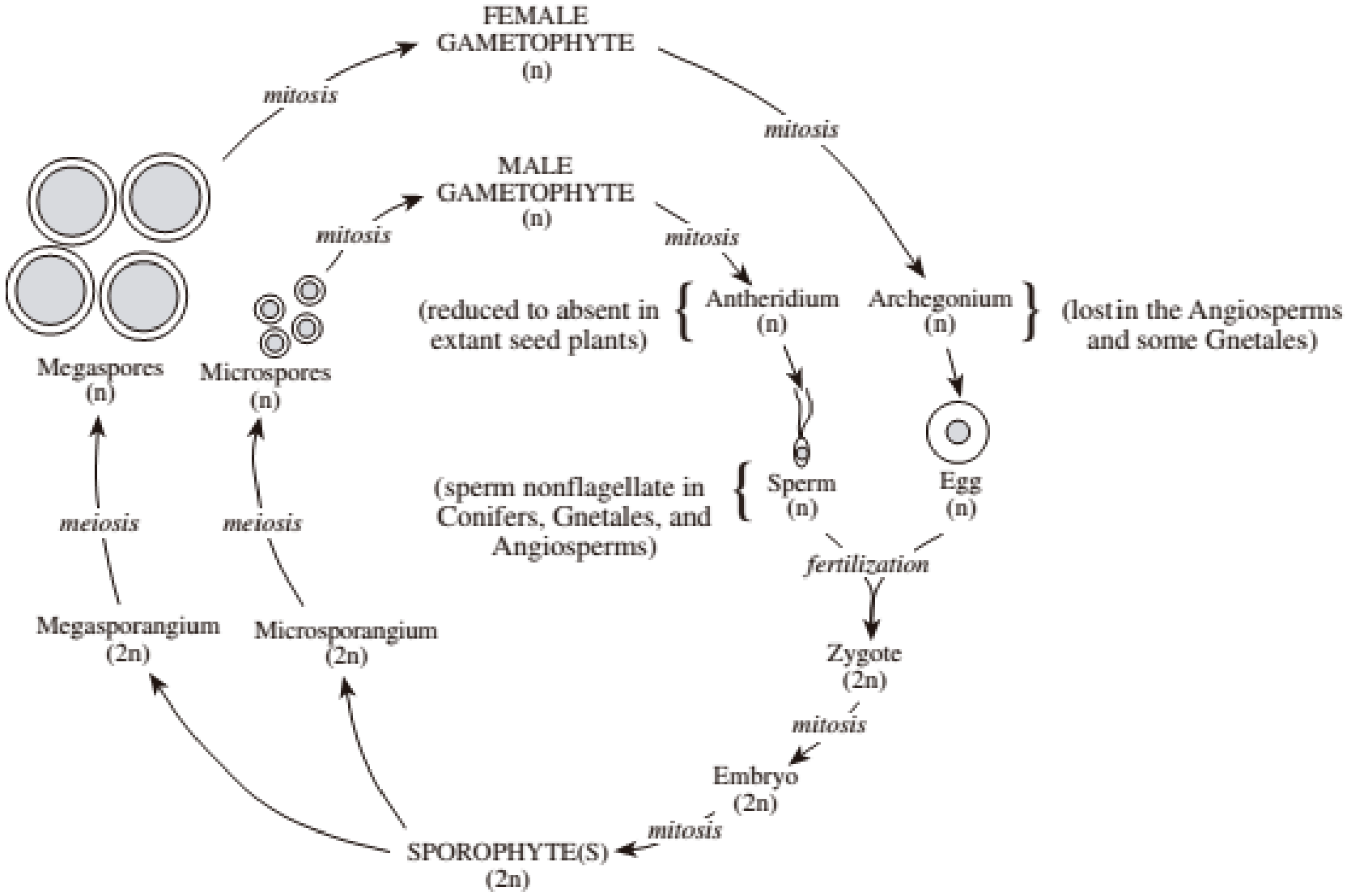


FIGURE 5.8 Life cycle of heterosporous plants.

APOMORPHY OF SPERMATOPHYTES

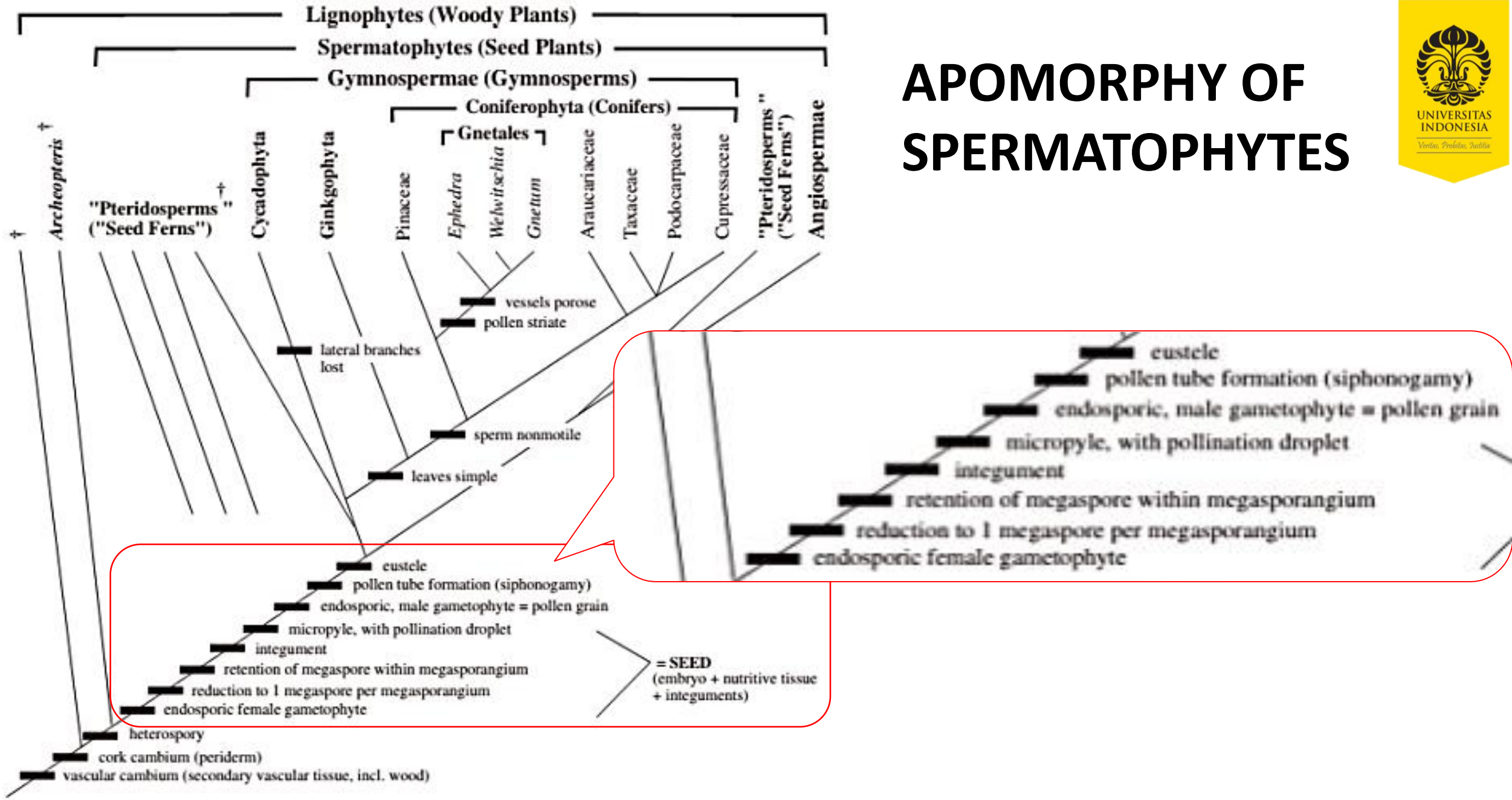


FIGURE 5.1 Cladogram of the woody and seed plants. Major apomorphies are indicated beside a thick hash mark. Modi ed from Bowe et al., 2000; Chaw et al., 2000; Frohlich et al., 2000; and Samigullin et al., 1999.

Eustele:

- An apomorphy for most spermatophyte
- A primary stem vasculature (primary meaning prior to any secondary growth) that consists of a single ring of discrete vascular bundles

- Each vascular bundle → internal strand of xylem, and external strand of phloem → radially oriented
- Protoxylem→ endarch

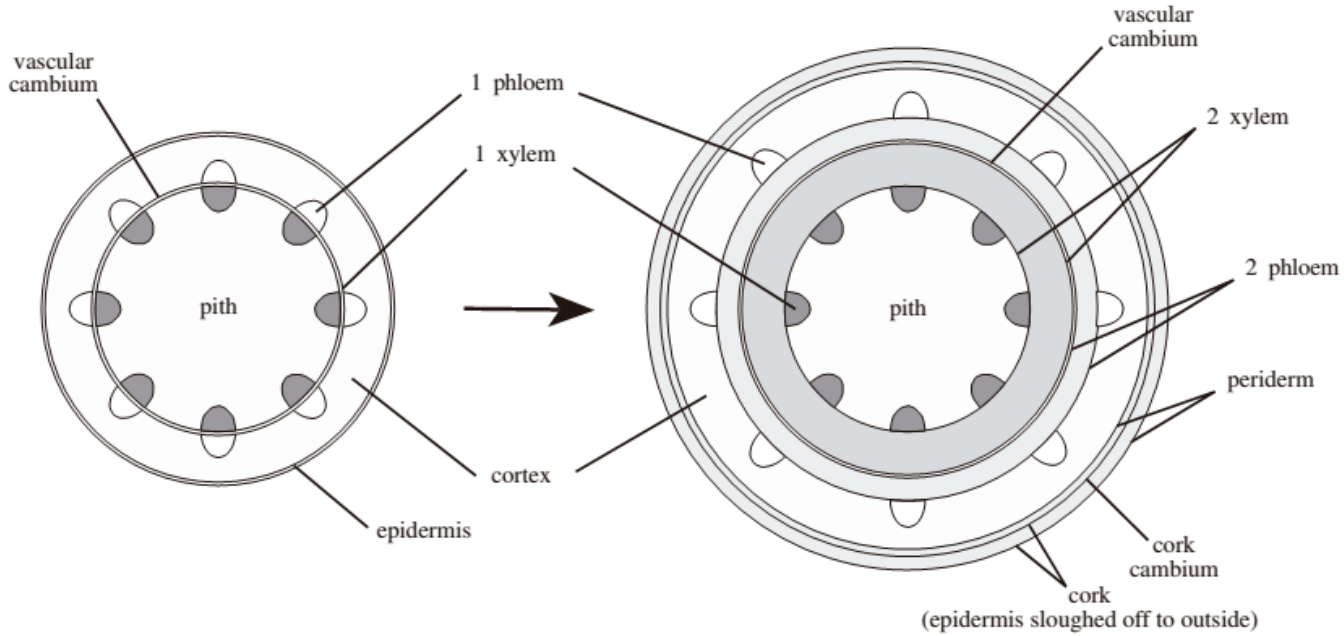
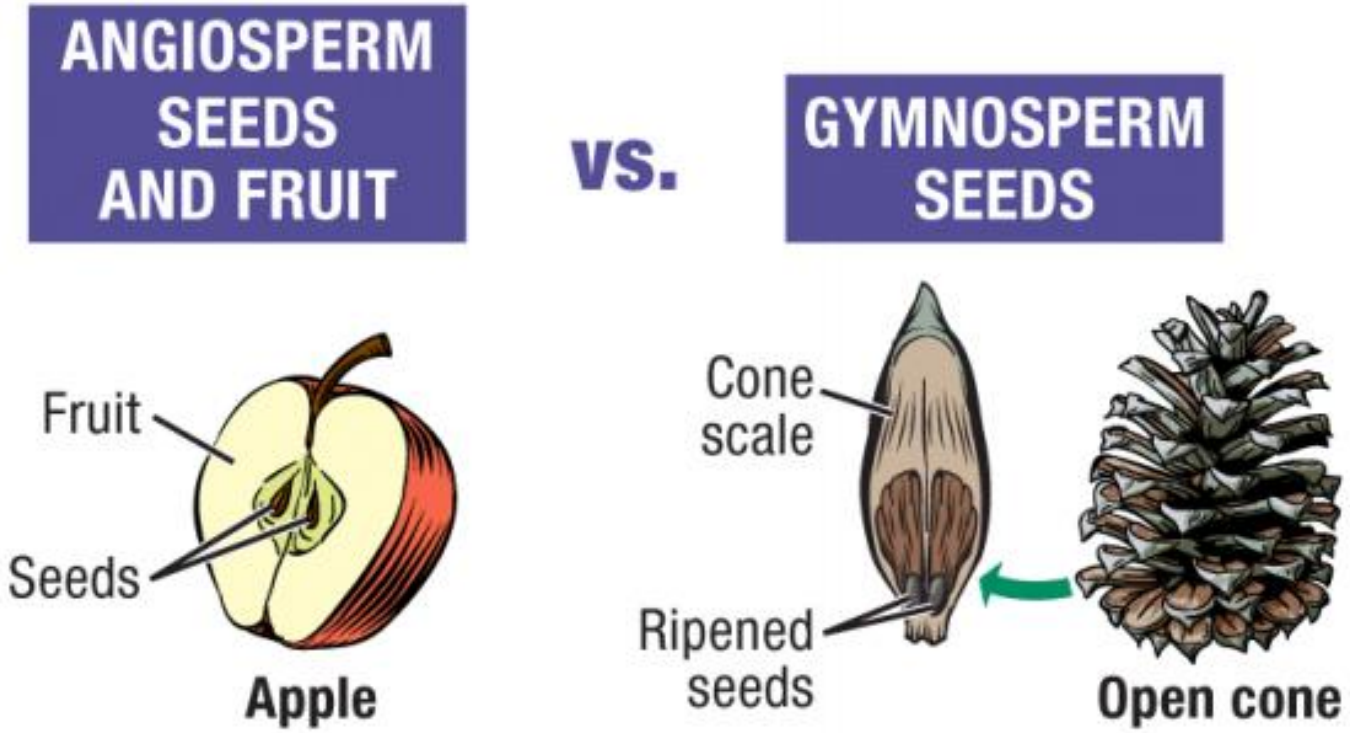
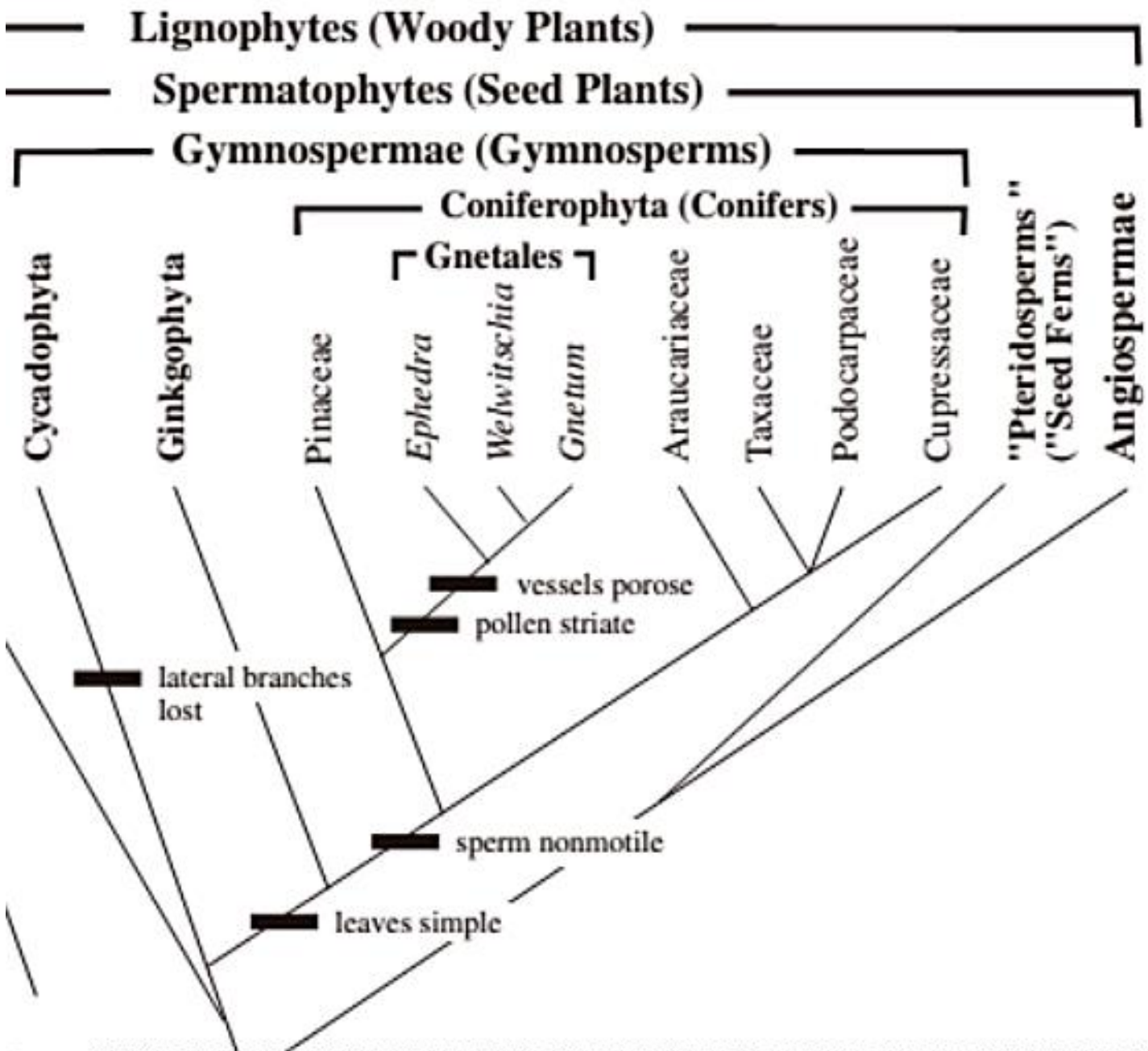


FIGURE 5.4 Development of secondary vascular tissue in the stem, illustrated here for a eustelic stem.

GYMNOSPERMS

- Vascular plants with seeds but no protective fruit or flower
- Seeds are exposed on modified leaves that usually form cones or strobili





et al., 2000; Chaw et al., 2000; Frohlich et al., 2000; and Samigullin et al., 1999.

Gymnosperms are a monophyletic group and are sister to the angiosperms

Table 6.1 Major Groups of Living Gymnosperms

Group	Common name	Estimated species
Cycadophyta	cycads	130–150
Ginkgophyta	ginkgos	1
Coniferophyta	conifers	600–650
Gnetophyta	gnetophytes	70–80

Thank you