Section D: The Origin of Vascular Plants

1. Additional terrestrial adaptations evolved as vascular plants descended from mosslike ancestors
2. A diversity of vascular plants evolved over 400 million years ago
Introduction

- Modern vascular plants (pteridophytes, gymnosperms, and angiosperms) have food transport tissues (phloem) and water conducting tissues (xylem) with lignified cells.

- In vascular plants the branched sporophyte is dominant and is independent of the parent gametophyte.

- The first vascular plants, pteridophytes, were seedless.
1. Additional terrestrial adaptations evolved as vascular plants descended from mosslike ancestors

- Vascular plants built on the tissue-producing meristems, gametangia, embryos and sporophytes, stomata, cuticles, and sporopollenin-walled spores that they inherited from mosslike ancestors.
• The **protracheophyte polysporangiophytes** demonstrate the first steps in the evolution of sporophytes.

  • These terms mean “before vascular plants” and “plants producing many sporangia,” respectively.

• Like bryophytes, they lacked lignified vascular tissues, but the branched sporophytes were independent of the gametophyte.

  • The branches provide more complex bodies and enable plants to produce many more spores.

  • Sporophytes and gametophytes were about equal in size.
2. A diversity of vascular plants evolved over 400 million years ago

- *Cooksonia*, an extinct plant over 400 million years old, is the earliest known vascular plant.
  - Its fossils are found in Europe and North America.
  - The branched sporophytes were up to 50cm tall with small lignified cells, much like the xylem cells of modern pteridophytes.