Chapter 4

Paper:

Beerling, David J., C. P. Osborne, and W. G. Chaloner. "Evolution of leaf-form in land plants linked to atmospheric CO_2 decline in the Late Palaeozoic era."*Nature* 410, no. 6826 (2001): 352-354.

Questions:

1. **What are the morphological differences between microphylls and megaphylls?**

2. **Why is it so surprising to the authors that it took over 40 million years for planate megaphyll leaves to evolve?**

3. **What is the oldest known fossil plant that evolved megaphyll leaves**

4. **What does the presence of *Eophyllophyton bellum* in the fossil record indicate about the evolution of leaves?**

5. **What methodology is used to test the costs and benefits of early land plants evolving megaphyll leaves?**

6. **Describe the major findings of the model as illustrated in Figure 1.**

7. **The model is used to predict the likely size of the earliest proto-leaves at different palaeo-latitudes. What leaf size range is suggested and why are the predictions different depending on latitude?**

8. **What species possessed the largest early leaves in the fossil record?**

9. **Why, according to the authors, did true megaphyll leaves not occur widely until the late Palaeozoic?**