**Chapter 9**

**Paper:**

Willis, K. J., A. Feurdean, H. J. B. Birks, A. E. Bjune, E. Breman, R. Broekman, J-A. Grytnes, M. New, J. S. Singarayer, and J. Rozema. "Quantification of UV-B flux through time using UV-B-absorbing compounds contained in fossil Pinus sporopollenin." *New Phytologist* 192, no. 2 (2011): 553-560.

Questions:

1. **What effect does UV-B radiation have on plants?**

2. **What factors influence the amount of UV-B radiation reaching the Earth's surface?**

3. **Why is it interesting or important to reconstruct UV-B radiation through geological time?**

4. **What 'proxy' or indicator method can be used to infer past levels of UV-B radiation?**

5. **What are the limitations associated with this proxy method?**

6. **What are the two main objectives of the paper?**

7. **How did the authors ensure that the procedures used to extract fossil pine pollen did not alter the original para-coumaric acid content of the pollen grain?**

8. **What are the key findings in relation to UV-B and para-coumaric acid abundance across modern latitudinal gradients?**

9. **What are the key findings in relation to Holocene UV-B?**

10. **What interesting features of Holocene UV-B history does the fossil pollen para-coumaric acid record show?**