

Final exam Palaeoecology 11.4.2013

Please indicate name and student number on every sheet used for the exam answers.

Use separate answer sheets for Q 1, 2 (together) and Q 4, 5 (together)!

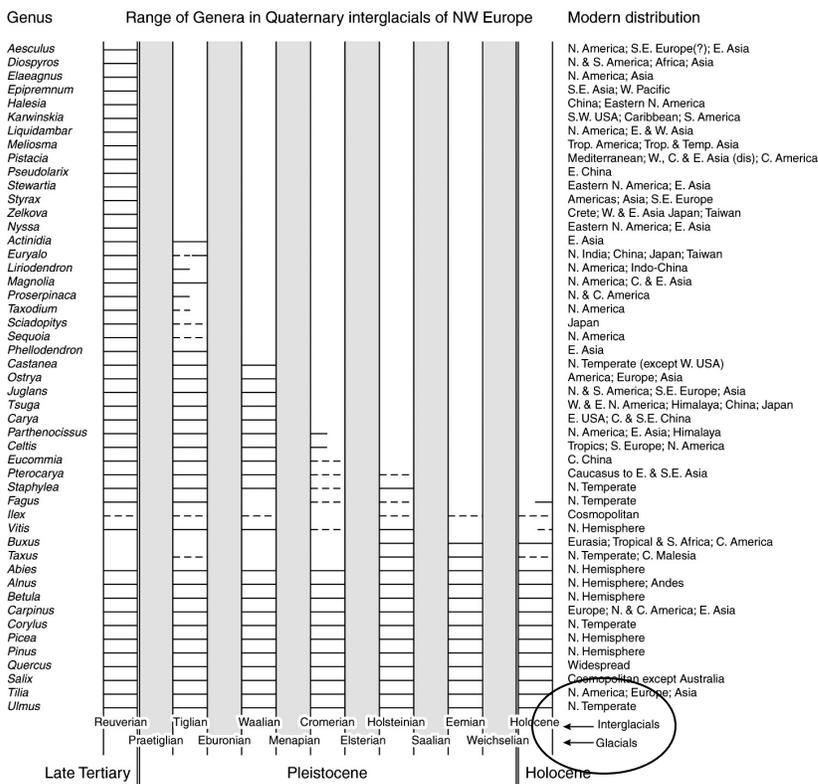
Answer multiple choice on exam sheet itself!

Answers may be given in Dutch or English

Success, and thanks for joining the course!

Remember to fill in the evaluation, please.

1) The below schematic overview of plant taxa occurrences in Europe shows a clear pattern of biodiversity loss. What causes these patterns? Explain your answer well and involve the **forcing** of the changes as well as the role of the **ocean circulation** in your answer.



2)

- a) What are the two most important abiotic controls on global vegetation distribution
- b) List and describe shortly 3 ways in which humans have influenced vegetation distribution on earth.

New answer sheet from here!

3)

Discuss the statement:

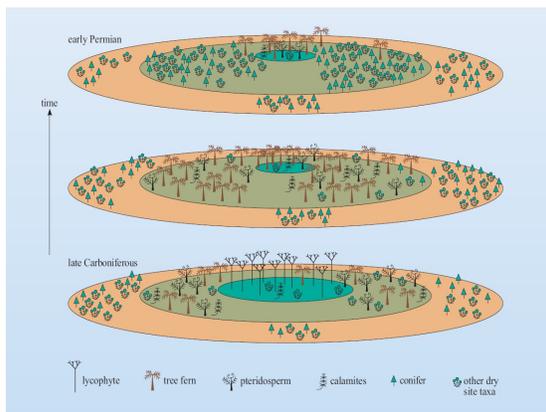
Palaeoecology ≠ Ecology

Consider the statement under taxonomical and environmental aspects by providing one example for each of the two topics.

4)

The evolution and abundance of plants is closely related to large-scale external processes that force changes in the environment plants need to adapt to.

- a) Which large-scale changes occurred around the late Carboniferous to early Permian?
- b) Which general changes in the vegetation pattern occurred during this time?



5)

During the Silurian plants conquered the continents. The transition from the marine realm to the terrestrial realm required some important modifications of the plant body.

- a) Which structural modifications enabled plant survival on land?

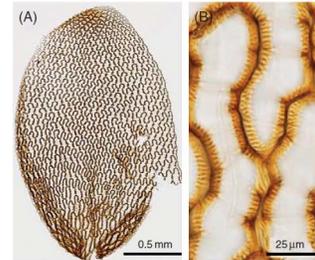
b) Why is the explosive growth of swamp forests during the Carboniferous so important for our daily life?

Multiple choice:

1) What structures are shown in the below pictures?

Sphagnum (peatmoss) leaf and cells

- a) Phragmites (Reed) seed and cells
- b) Chironomid (non-biting midge) head capsule
- c) Fossil DNA strings



2) Which answer correctly explains both why pollen analysis is such a popular method, and what is the major drawback?

- a) Pollen are resistant to decay, but they are not present in marine sediments
- b) Pollen are very numerous fossils, but they mostly cannot be identified to species level
- c) Pollen provide fossil DNA of millions of years old, but are only produced by conifers
- d) Pollen allow quantitative reconstruction of vegetation patterns, but a large sediment sample is needed

3) Mass extinctions are defined as events of major biodiversity losses, where the life forms that became extinct must have belonged to different phyla, lived in different habitats, spread out over whole world. However, there are structural differences between the extinction impact on different organisms. Mark the right impact relation:

- a) Flora = Fauna
- b) Flora > Fauna
- c) Flora < Fauna

4) Endosporie is een belangrijke stap op de weg van spore naar zaadplanten. Wat is endosporie?

- a) Het zich ontwikkelen van de nieuwe sporophyt binnen de spore van de vorige generatie
- b) Het zich ontwikkelen van de nieuwe gametophyt binnen de gameet van de vorige generatie
- c) Het zich ontwikkelen van de nieuwe spore binnen de spore van de vorige generatie
- d) Het zich ontwikkelen van de nieuwe spore binnen de gameet van de vorige generatie

5) The famous geologist Alfred Wegener for the first time postulated the hypothesis that:

- a) A meteorite impact contributed to the K/T mass extinction
- b) Continental plates drift and change position through time

c) Photosynthetic activity of land plants is capable of reducing atmospheric CO₂ concentrations

6) Which of the 'big five' mass extinction events is considered to be the most severe one?

- a) Late Ordovician
- b) Late Devonian
- c) End Permian
- d) Late Triassic
- e) K/T Boundary

7) Wat is het positieve effect van dubbele bevruchting zoals bij angiospermen t.o.v. de enkele bevruchting zoals bij gymnospermen ?

- a) Meer genetische variatie, dus meer survivalkansen
- b) Alleen endosperm aangemaakt na bevruchting, dus energiebesparing
- c) Het endosperm is voedzamer, dus meer kans voor
- d) Dubbele bevruchting levert een kiemkrachtiger zaad op

8) The Permian was:

- a) extremely dry
- b) extremely wet
- c) extremely windy

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10) The vegetation of which geological periods is characterized by high biodiversity?

- a) Devonian
- b) Carboniferous
- c) Jurassic

