Organic facies and depositional palaeoenvironment of lignites from Rio Maior Basin (Portugal)

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The Rio Maior Basin (Portugal) is a tectonic depression, filled by a Pliocene sequence that comprises, from floor to roof: (i)kaoliniferous fine sands, (ii)diatomites and lignites, (iii)recent deposits of sandstone and clay. The diatomites and lignites form a small dissimetric syncline with alternating seams. Ten lignite seams were identified and named from floor to roof as F, E, D, C.2, C.1, C, B, A, a and a'. Seams A, D, E and F are considered to be the main seams.

The organic fraction consists mainly of macerals of the huminite group, with small percentages of inertinite and liptinite groups. However, the petrographic composition of each seam is distinct, particularly with regards to macerals of the huminite and liptinite groups.

Calculation of petrographic indices permitted to plot the coals in facies and palaeoenvironment diagrams. Five facies have been defined: (i)aquatic, (ii)herbaceous swamp, (iii)mixed swamp with forest and herbaceous vegetation, (vi)forest swamp (more wet) and (v)forest swamp (more dry).

These lignites are humic coals formed from organic matter of terrestrial origin. The peat biomass on the origin of these coals was formed from a very diverse vegetation comprising gymnosperms and angiosperms. In seams F, and occasionally in seams E and D, *Botryococcus* algae have also contributed to the biomass. The peat deposition corresponds to a rheotrophic hydrological regime: the water level remained always above the topographic surface of the basin. Nevertheless, during the deposition of seam A in the northern part of the basin the water level have been slightly below the topographic surface. The organic matter was preserved in anaeorobic conditions.