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Palynostratigraphical correlation of the excavated Miocene lignite seams of the Yatağan basin (Muğla Province, south-western Turkey)

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The excavated main lignite seams and overlying lacustrine sediments of the opencast mines Eskihisar, Salihpaşalar, and Tı naz, Muğla Province, south-western Turkey were investigated using a high taxonomic resolution palynological approach.

The Eskihisar section comprises 47m and 56 samples of which 30 were usable for palynological analysis. The Tı naz section comprises 75 m and 29 samples of which 15 were usable for palynological analysis. Finally, the Salihpaşalar section comprises 25 m and 26 samples of which 16 were usable for palynological analysis. The age of the palynological sections is middle to late Miocene based on radiometric dating and vertebrate fossils.

In order to investigate dispersed pollen and spores and their botanical affinities a combined light microscopy and scanning electron microscopy approach was used. The rich palynoflora comprises: seven types of algal cysts (*Botryococcus*, Zygnemataceae), seventeen spore types belonging to Lycopsida (club mosses), Marsileaceae (water-clover), Osmundaceae, Pteridaceae (brake), and Polypodiaceae; 14 types of gymnosperm pollen belonging to Ephedraceae (Mormon tea), Cupressaceae, Pinaceae (*Cathaya*, cedar, hemlock, pine, spruce); five types of monocotyledone pollen belonging to Poaceae (grasses, common reed), and Typhaceae (bulrush, bur-reed); ca 90 dicotyledone pollen types belonging to Altingiaceae (sweet gum), Amaranthaceae (goosefoot), Anacardiaceae (sumac family), Apiaceae (parsley family), Aquifoliaceae (holly), Asteraceae (sunflower family), Betulaceae (alder, birch, hazel, hophornbeam, hornbeam), Campanulaceae (bellflower family), Cannabaceae (hackberries), Caprifoliaceae (honeysuckle, teasel family), Caryophyllaceae (pink family), Ericaceae (heather family), Eucommiaceae, Euphorbiaceae (spurge family), Fabaceae (bean family), Fagaceae (beech, oak), Geraniaceae (storkbills), Juglandaceae (hickory, walnut, wingnut), Lamiaceae (bagflower), Linaceae (flax), Lythraceae (waterwillow), Malvaceae (basswood, mallow family), Myricaceae (bayberry), Oleaceae (olive family), Onagraceae (evening primrose family), Plumbaginaceae (sea-lavender), Polygonaceae (docks, knotweed), Ranunculaceae (buttercup family), Rosaceae (rose family), Salicaceae (willow), Sapindaceae (maple), Sapotaceae, and Ulmaceae (elm, *Zelkova*).

The objectives of this investigation were (1) to evaluate whether the three palynological sections were deposited at the same time, and (2) to show regional vegetation differences within a single sedimentary basin.

We found three general pollen zones corresponding to different sedimentary settings and palaeoenvironments. The first pollen zone was linked to lignite formation (swamp forest, fern spores, *Alnus*, *Decodon*). The second pollen zone reflects lacustrine conditions (Typhaceae) and surrounding hinterland vegetation dominated by Fagaceae. The third pollen zone is dominated by herbaceous taxa, whereas woody taxa are less diverse and less abundant.

In general, the three palynological sections are congruent in reflecting distinct pollen zones. However main vegetation types may be represented by different dominating taxa (e. g. *Alnus* dominace in Eskihisar and Tı naz localities while absent in Salihpaşalar) and rare taxa may differ between localities.

Our results demonstrate that in order to achieve a comprehensive understanding of environmental and vegetation conditions in a sedimentary basin, a single palynological section (locality) may not capture the entirety of environmental conditions and changes.